

# PERSONAL COMPUTING

A Hayden Publication

June 1984  
\$2.50 USA

## COMPUTER CAMPS

**Getting The  
Most Out Of  
Spreadsheets**

**Modem Mistakes  
You Don't  
Have To Make**

**A Buyer's Guide  
To Monitors**

**Software That  
Makes Music**



DEAR DAD,  
WE'RE LEARNING WORD PROCESSING...  
PLEASE...SEND MONEY!

Canada & International \$3.50





Thanks to a remarkable notebook-sized computer made by NEC, you can take your office with you anywhere you go. On a plane, on a park bench, on the way to a meeting, or even on a beach.

Though it weighs only 4 pounds, the battery-powered, CMOS-based PC-8200 packs a 16K/16K RAM memory expandable to 96K. And 32K of ROM expandable to 64K. You get a big 40-character/8-line screen. Plus

NEC gives you 14 free software packages to start, including an investment portfolio and word processing.

With its built-in software and telecommunicating capabilities, you can use the PC-8200 for word processing, time sharing, data entry, record keeping, and for electronic mail. You name it.

It's made by NEC—a world leader in computer and communications technology.

# NEC

CIRCLE 48

**NEC Home Electronics (U.S.A.), Inc.  
Personal Computer Division**

1401 Estes Avenue  
Elk Grove Village, IL 60007

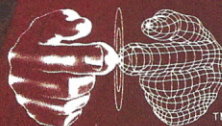
NEC Corporation, Tokyo, Japan

## NEC reinvents the office.

NEC beats the leading competition hands down:

	NEC PC-8200	Radio Shack Model 100	Hewlett- Packard HP-75
Price	\$799*	\$799	\$995
RAM/ROM	16K/32K	8K/32K	16K/48K
RAM Expandability (Internal/External)	To 96K (64K/32K)	To 32K (32K/none)	To 24K (24K/none)
Free bundled software	Yes	No	No
Function keys	10	8	0
RAM cartridges	Yes	No	No
Bar Code Reader, RS232, Parallel Port, Cassette Port	Yes	Yes	Not Standard
Floppy Disk and SIO Port, Cursor Cluster	Yes	No	Not Standard

\*Includes perpetual clock calendar. NiCad battery pack, AC adapter charger optional.



Productivity at your fingertips



# SoftCard squeezes the most juice out of your Apple.



Microsoft® Premium SoftCard IIe is the high-performance CP/M® board that really juices the Apple® IIe.

## Hard facts on SoftCard.

It has a high speed (6MHz) Z-80 that runs CP/M up to three times faster than lesser boards. Plus 64K memory and 80-column display that fits the IIe auxiliary slot and acts like Apple's own Extended 80-column Card. So it works with CP/M, Apple DOS and ProDOS programs, too.

Microsoft BASIC is built-in, so it's compatible with more Apple CP/M software than any other board on the market: Thousands of the juiciest business programs including dBase II®, WordStar® and sophisticated Microsoft languages like

FORTRAN-80, COBOL and BASIC Compiler.

It also has a new low price.

Juicing up the performance of computers is nothing new for us. We invented the SoftCard and make versions for the entire Apple family. We wrote Applesoft for the Apple II.

**MICROSOFT** In fact, our The High Performance Software BASIC is the language spoken by nine out of ten microcomputers worldwide.

Get the Apple juicer from Washington. Call 800-426-9400 (in Washington State call 206-828-8088) for the name of your nearest Microsoft dealer.

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Winning On Wall Street lets  
you build and maintain a data  
base of securities, perform  
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*Choosing a computer camp*  
*for your children.*



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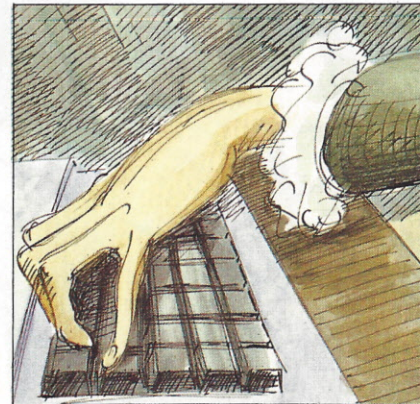
Some tricks and shortcuts from expert users can help you take full advantage of a powerful program.

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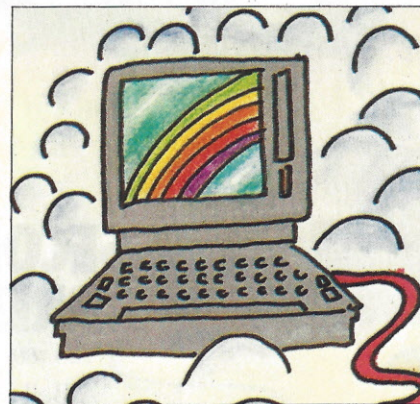
Massive storage capacity is only one of the benefits of using hard disks. They can also speed processing and make file management easier.

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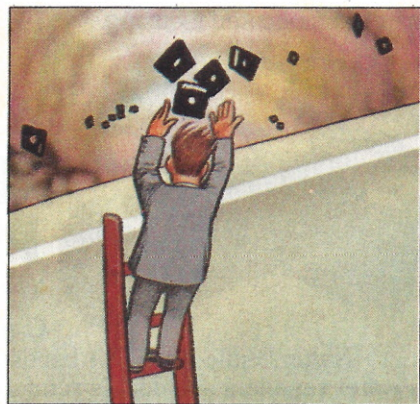
What you see is what you get, but don't overlook specific applications.



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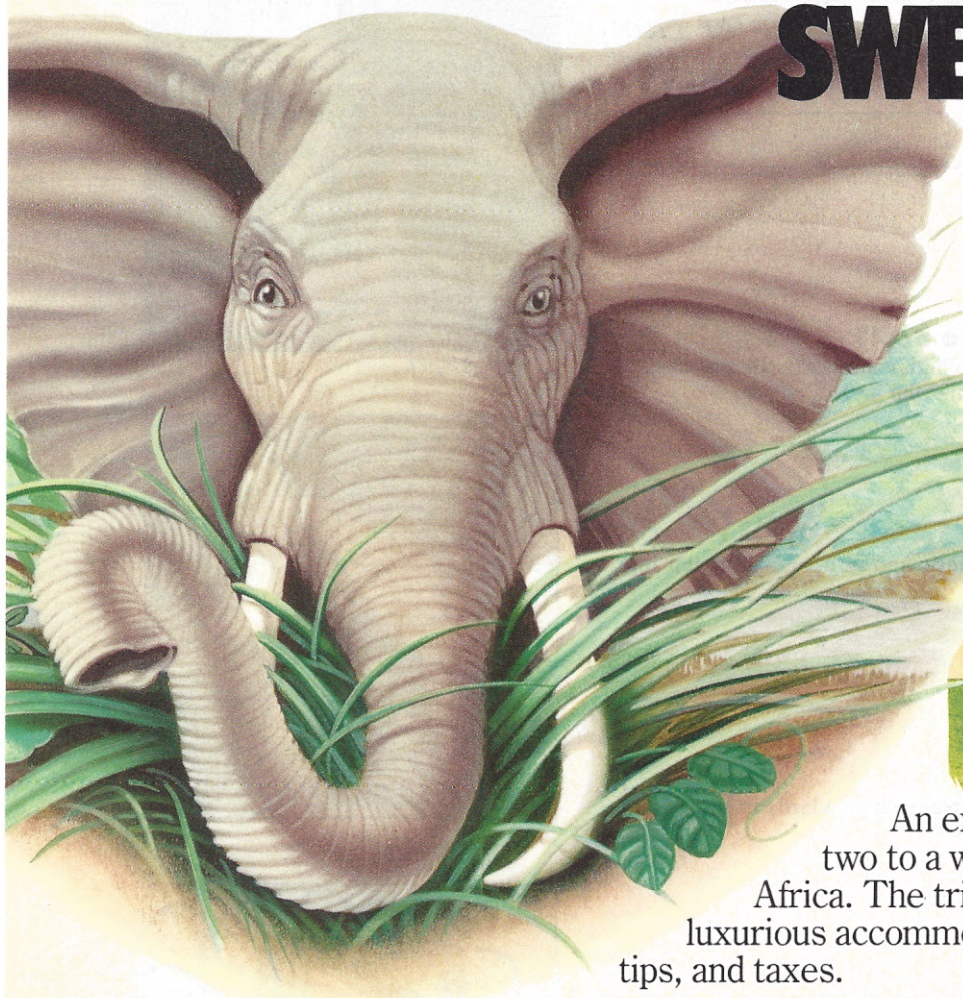
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# ENTER THE ELEPHANT SAFARI™ SWEEPSTAKES.



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(1 winner)



An exciting two week adventure for two to a wild game preserve in Kenya, Africa. The trip includes airfare, luxurious accommodations, meals, tips, and taxes.



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(25 winners)

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And thousands of Elephant Safari camouflage T-shirts featuring the Elephant logo.

## FIRST PRIZE

(5 winners)

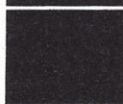
A Deluxe Camping Package featuring an 8' x 10' Wenzel Cabin Tent, four Wenzel sleeping bags, plus a Coleman lantern, stove and cooler.



## HOW TO ENTER

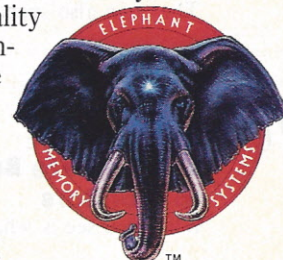
No purchase necessary. Just come into a participating Elephant Safari Sweepstakes dealership where you'll find free entry blanks and official rules. While you're there, check out our full line of quality Elephant memory disks and accompanying products. Entries must be received by July 31, 1984. Void where prohibited.

**Dennison**



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**ELEPHANT NEVER FORGETS**



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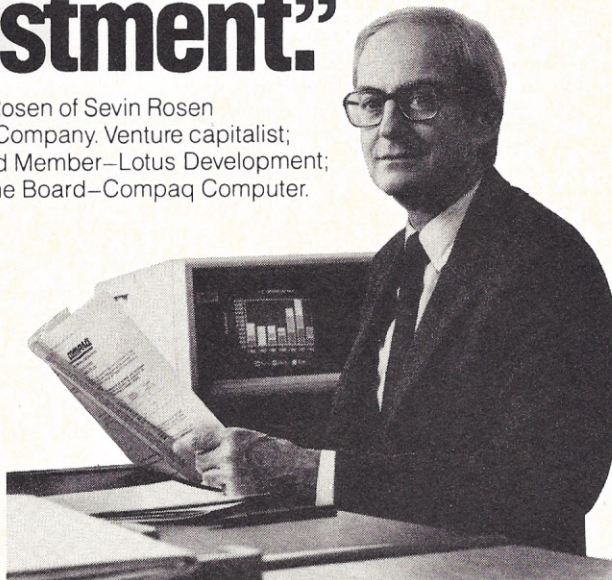
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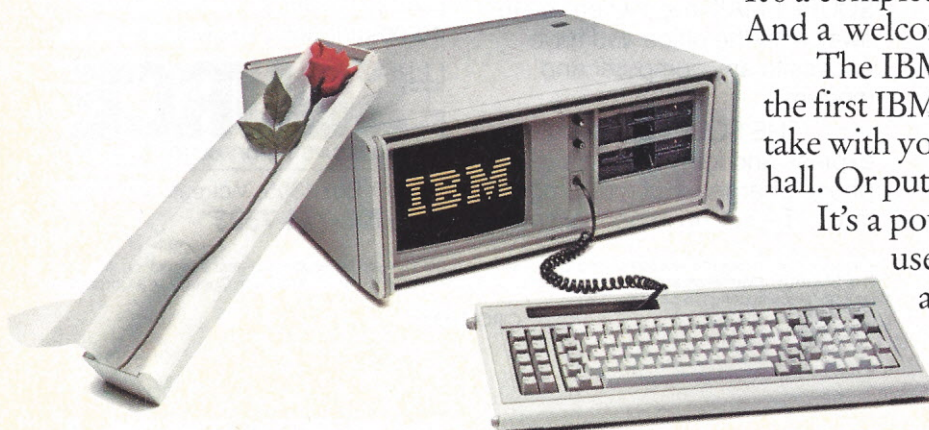
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# Don't buy Omninet just because it's the #1 network.

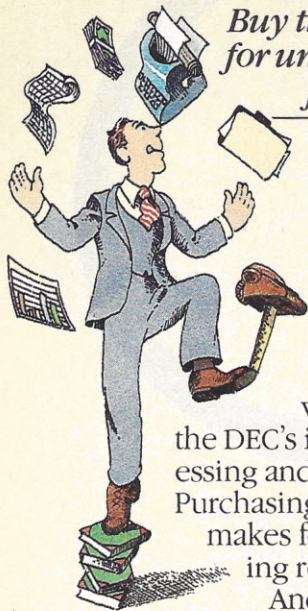
## *Buy it because it's the best buy.*

At under \$500 per node, OMNINET has the lowest cost per station of any local area network.

Because an OMNINET Network uses simple, twisted pair wire. Which means that cabling costs one fifth of the coaxial alternatives, with none of the installation headaches.

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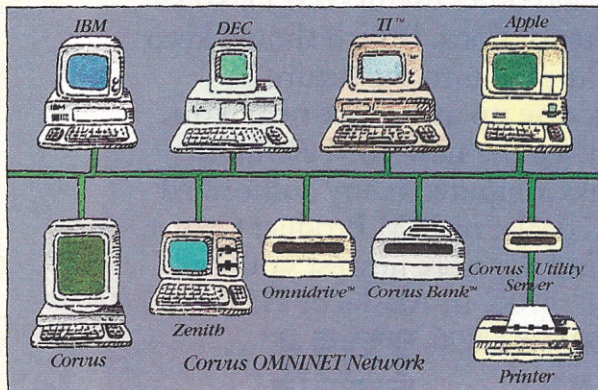
## *Buy the system for unmatched flexibility.*



From Apples to Zeniths, OMNINET handles more types of micros than any other network. So keep the DEC's in Data Processing and the PC's in Purchasing; OMNINET makes for great working relationships. And starting with

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## *Buy the OMNINET Network for the most expandability.*

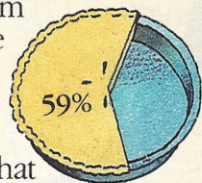
If you're just starting a network, consider OMNISHARE™ Software. It lets your regular PC's or PC-compatibles make full use of the disk space on an IBM PC XT.™

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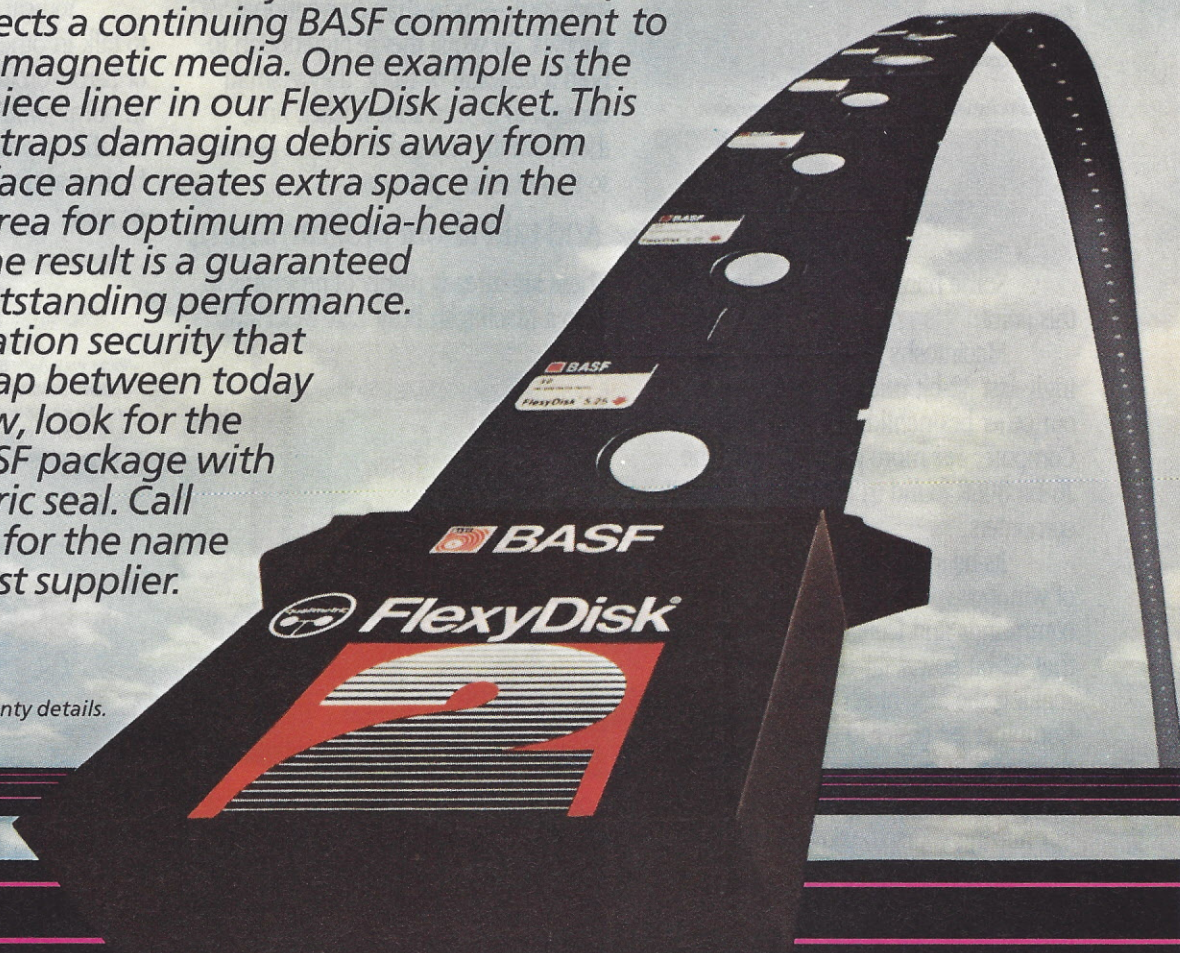
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**BASF**



# Introducing Macintosh. What makes it tick. And talk.

Well, to begin with, 110 volts of alternating current.

Secondly, some of the hottest hardware to come down the pike in the last 3 years.

*The garden variety 16-bit 8088 microprocessor.*



*Macintosh's 32-bit MC68000 microprocessor.*



Some hard facts may be in order at this point:

Macintosh's brain is the same blindingly-fast 32-bit microprocessor we gave our other brainchild, the Lisa™ Personal Computer. Far more powerful than the 16-bit 8088 found in current generation computers.

Its heart is the same Lisa Technology of windows, pull-down menus, mouse commands and icons. All of which make that 32-bit power far more useful by making the Macintosh™ Personal Computer far easier to use than current generation computers. In fact, if you can point without hurting yourself, you can use it.

Now for some small talk.

Thanks to its size, if you can't bring the problem to a Macintosh, you can always

bring a Macintosh to the problem. (It weighs 9 pounds less than the most popular "portable.")

Another miracle of miniaturization is Macintosh's built-in 3½" drive. Its disks store 400K—more than conventional 5¼" floppies. So while they're big enough to hold a desk full of work, they're small enough to fit in a shirt pocket. And, they're totally encased in a rigid plastic so they're totally protected.

And talk about programming.

There are already plenty of programs to keep a Macintosh busy. Like MacPaint™



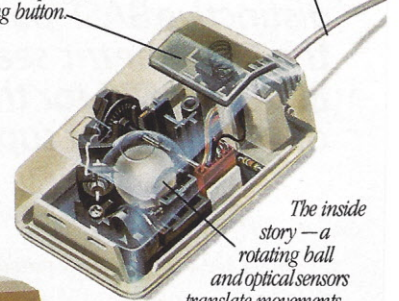
a program that, for the first time, lets a personal computer produce virtually any image the human hand can create. There's more software on the way from developers like Microsoft®, Lotus™ and Software Publishing Corp., to mention a few.

And with Macintosh BASIC, Macintosh Pascal and our Macintosh Toolbox for writing your own mouse-driven programs, you, too, could make big bucks in your spare time.

You can even program Macintosh to talk in other languages, like Yiddish or Serbo-Croatian, because it has a built-in polyphonic sound generator capable of producing high quality speech or music.

*The Mouse itself. Replaces typed-in computer commands with a form of communication you already understand — pointing.*

*Some mice have two buttons. Macintosh has one. So it's extremely difficult to push the wrong button.*



*The inside story — a rotating ball and optical sensors translate movements of the mouse to Macintosh's screen pointer with pin-point accuracy.*

All the right connections.

On the back of the machine, you'll find built-in RS232 and RS422 AppleBus serial communication ports. Which means you can connect printers, modems and other peripherals without adding \$150 cards. It also means that Macintosh is ready to hook in to a local area network. (With AppleBus, you will be able to interconnect up to 16 different Apple computers and peripherals.)

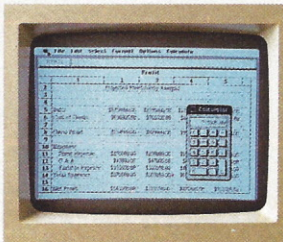
Should you wish to double Macintosh's storage with an external disk



*Macintosh automatically makes room for your illustrations in the text.*

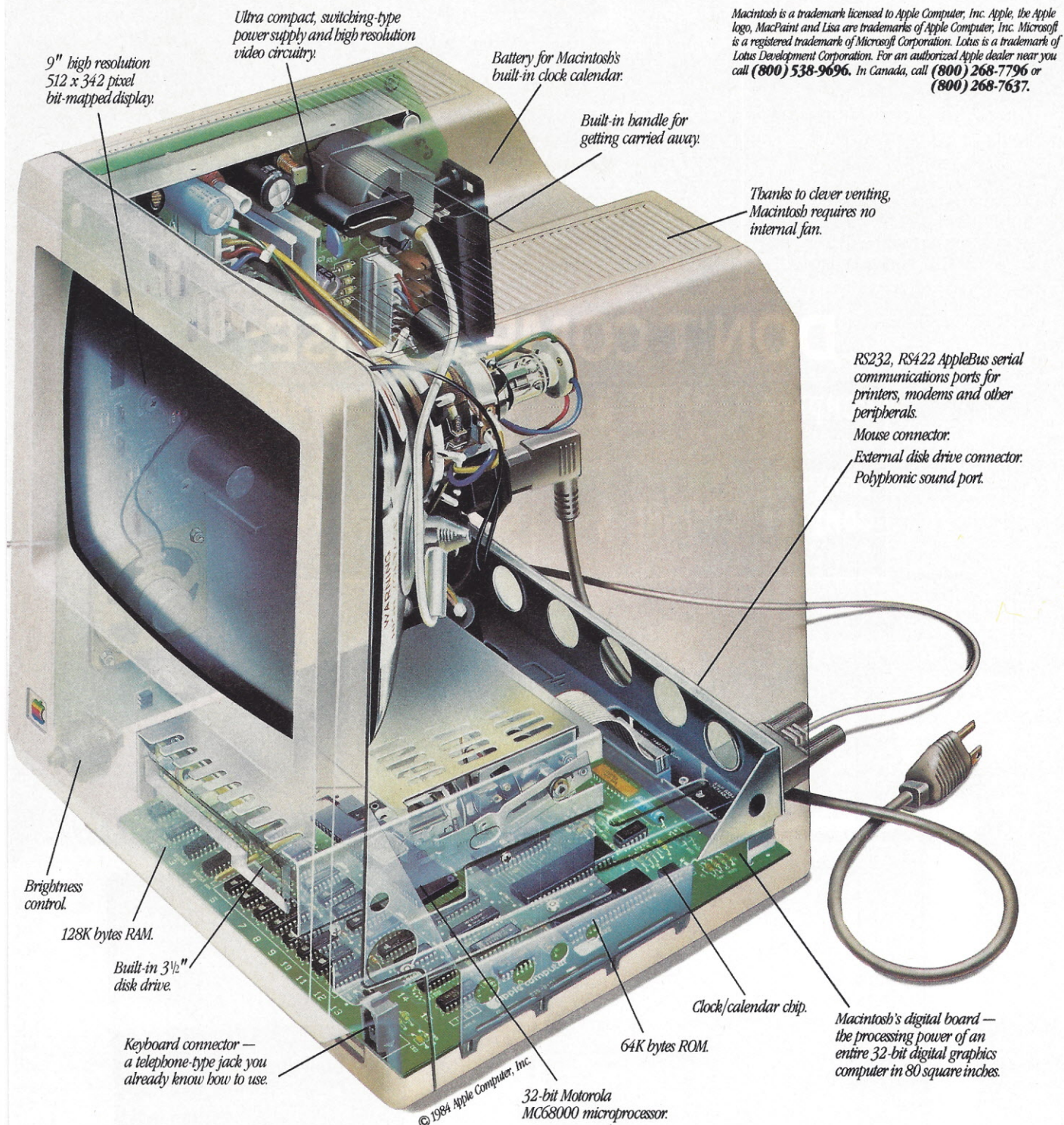


*MacPaint produces virtually any image the human hand can create.*



*Microsoft's Multiplan for Macintosh.*





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drive, you can do so without paying for a disk controller card—that connector's built-in, too.

There's also a built-in connector for Macintosh's mouse, a feature that costs up to \$300 on computers that can't even run mouse-controlled software.

### One last pointer.

Now that you've seen some of the logic, the technology, the engineering genius and the software wizardry that separates


Macintosh from conventional computers, we'd like to point you in the direction of your nearest authorized Apple dealer.

Over 1500 of them are eagerly waiting to put a mouse in your hand. As one point-and-click makes perfectly clear, the real genius of Macintosh isn't

its 32-bit Lisa Technology, or its 3 1/2" floppy disks, or its serial ports, or its software, or its polyphonic sound generator.

The real genius is that you don't have to be a genius to use a Macintosh.

You just have to be smart enough to buy one.

Soon there'll be just two kinds of people. Those who use computers. And those who use Apples. 



When you visit your dealer and compare the Princeton IBM-compatible HX-12 side-by-side with the IBM color monitor, your eyes will see the difference.

The HX-12 gives you higher resolution and finer dot pitch (.31mm) than the IBM 5153's medium resolution (.43mm) for a cleaner, sharper image.

Compare our full range of colors and our crisp whites without red bleed. You'll also see a difference in our non-glare screen—a feature your eyes will really appreciate in a long work session.

The Princeton HX-12 comes with a cable that plugs directly into the IBM PC, ready to burst forth into 16 superb colors. All at a suggested retail price (\$695) that's a pleasure for sore eyes and overworked budgets.

**Apple IIe users:** call us to learn how you, too, can now enjoy the visible superiority of the Princeton HX-12.

Ask your local dealer for a demonstration and let your eyes decide. Or call us at 800-221-1490 for more information and the name of your nearest dealer.

If you're ready to move up to color, graduate to the Princeton HX-12. It's right at the head of its class.

Now available at Computerland, Entre and local independent computer dealers.

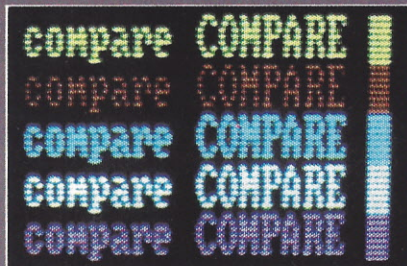
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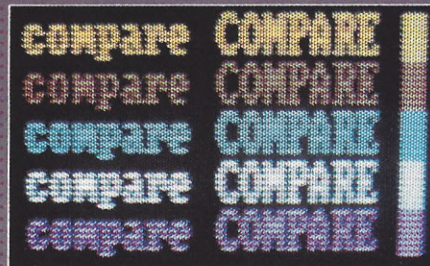
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CIRCLE 78

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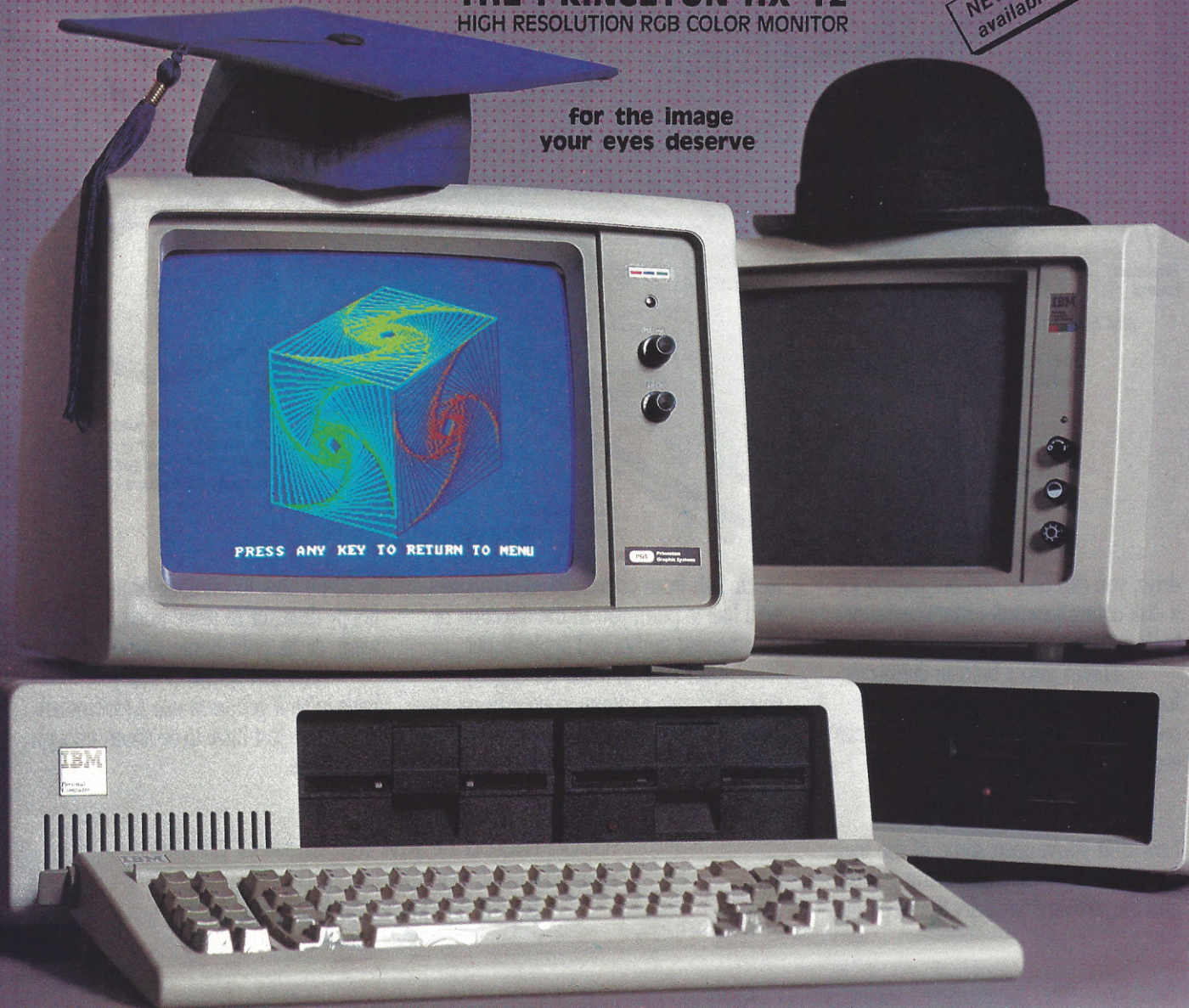


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CIRCLE 46



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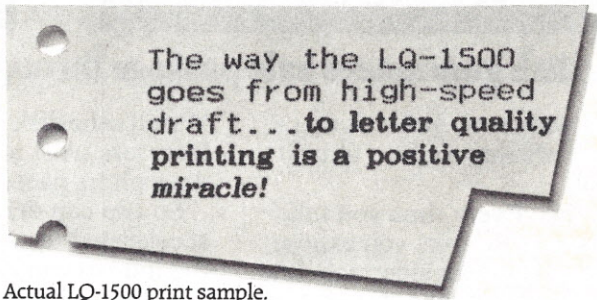
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CIRCLE 72



# Industry Giants Unveil Their Best Yet

■ **Apple IIc** ■ **IBM Portable Personal Computer** ■ **HP 110**  
 ■ **Framework** ■ **Symphony** ■ **Dow Jones Spreadsheet Link**  
 ■ **Winning On Wall Street** ■ **In Search**

## A NEW ADDITION TO THE APPLE FAMILY

by Kevin Strehlo, Senior Editor

**T**he people at Apple like to say there's nothing junior about the Apple IIc, a repackaged, compact version of the Apple IIe. For most personal computer users, the IIc will prove functionally equivalent and operationally superior to its big brother—in large part due to the wonderful feel of its keyboard. If you add the optional 24-line flat-panel display due later this year and battery packs promised by other vendors, what you've got in the IIc is basically equivalent to a 128k IIe and 80-column monitor in a package small enough to slip into a roomy briefcase.

True, if you want flexibility—for adding a hard disk, a CP/M card, or something exotic like an analog-to-digital converter—you'll want to stick to the Apple IIe with its accessory slots. But a IIc is less expensive than a comparably equipped IIe. (At press time, price was scheduled at \$1300.)

The Apple IIc is not completely compatible with the Apple IIs that preceded it. Ironically, one of the chief causes of incompatibility is the quality of the IIc's electronics. Some software uses a copy protection scheme that expects a certain error rate in a sample it pulls off the disk drives. The IIc's disk controller circuitry is simply too good, and software with such copy protection won't load. Apple says extensive compatibility testing has shown that "90 to 95 percent" of all Apple II software does run on the IIc, however, and that vendors are being notified and encouraged to correct any incompatibility problems.

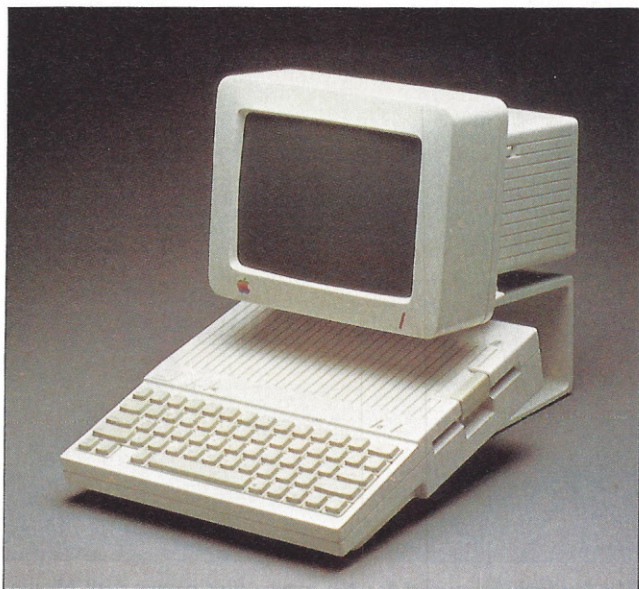
The styling of the IIc hints of Apple's intentions for it: This is a serious personal computer designed to complement the decor of the young urban professional's apartment, and at 7½ pounds without monitor it is certainly light enough to tote back and forth to work.

Just as likely a commute for the IIc, however, is between the living room, where the kids hook it up to the television to run educational or entertainment software, and the study, where Mom and Dad flip the 40- to

80-column switch and attach it to a monitor and an extra disk drive to run personal productivity software.

The complete computer literacy course included with each IIc—six interactive disks covering the keyboard, the inner workings of computers, the BASIC and Logo languages, personal productivity software, and leisure activities—makes it even more attractive for the home, where computer literacy is one of the primary motivations for buying a personal computer. Furthermore, unlike earlier Apple IIs, the IIc is extensively shielded to prevent leaks of RF radiation, and should cause no interference with television reception.

The IIc is a carefully conceived package. True, it is electronic wizardry that makes the IIc's packaging possible: Custom chips like the IWM (Integrated Woz Machine) and a new keycap technology contribute much



The styling of the IIc and its matching monitor are setting the standards for the look of future Apple products.



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## PRODUCT REVIEWS

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to the IIc. But new technology or no, credit for a triumph like the sublime combination of travel, tactile feedback, and audible click that is the IIc keyboard belongs to the artistic synergy of marketing, design, and engineering.

The Apple IIc is a slick machine. We point to the rakish 10 degree tilt of the upper surfaces, the elegant neutral color (Apple calls it "snow beige") the smooth surfaces, and the sleek lines of the IIc and its matching components. The result of a collaboration between Apple's designers and award-winning German designer Hartmut Estlinger, the look is clean and stylish.

### *Function as well as style*

The extensive industrial design work for the IIc involved more than aesthetics, however. If you look closely at the right side panel, for example, you will notice a  $5\frac{1}{4}$ " disk drive built into the IIc. Designing the latch for that drive door was a challenge, simply because the latch had to be easy to use either from the side (on the built-in drive) or from in front (with the optional external drive).

The IIc includes the electronics to handle that additional external drive as well as a modem, printer, monitor, joystick and mouse. According to Apple's research, and common sense, a vast majority of users will never want to hook up anything else. But fitting so many ports within the limits of the IIc's small back panel was another design challenge, solved by the use of round five-prong DIN-style plugs instead of oblong connectors.

The DIN connectors, combined with matching icons on Apple cables and the IIc's back panel, also make con-



A close look at the right side panel of the IIc will reveal a built-in  $5\frac{1}{4}$ " floppy disk drive. An external drive is optional.

necting the IIc and its peripherals easy, not a trivial point for computer novices. Unfortunately, it may be difficult to get the correct cable to hook up non-Apple components to the IIc.

Besides looks, there are functional reasons for buying the matching components. The Monitor IIc, for example, is designed to stand on a pedestal, and while there are aesthetics involved here, the real reason for elevating it is twofold: to get it to a comfortable viewing height, and because it cannot rest directly on top of the IIc as it could on a IIe or a II Plus.

The IIc crams a lot of heat-producing circuitry into a relatively small space, which translates into a potential heat problem. The attractive lines on the top of the IIc are actually vents to dissipate that heat, and blocking the airflow with a monitor could lead to computer dysfunction or melted floppy disks. So if you'd prefer another monitor, perhaps one with a larger display than the 9" screen of the Monitor IIc, be prepared to put it on a makeshift pedestal, or at least somewhere other than the top of the computer.

Another example of how the styling of the IIc peripherals proves functional is the new printer, called the Scribe. Consider the stand that makes the Scribe match the 10 degree tilt motif of the IIc family. That stand does more than tilt the printer: It holds 100 sheets of paper—not coincidentally, the number you can print before you need to change the ribbon—and allows you to feed continuous sheet paper to the printer even if the Scribe is pushed up against the wall.

Styling aside, the Scribe may be the best thing going at \$299. Because it is based on thermal transfer technology, it is relatively quiet and can print on any smooth surface you can wrap around the platen—even transparent acetate. This allows the Scribe, which can be loaded with a multicolor ribbon, to make overhead transparencies

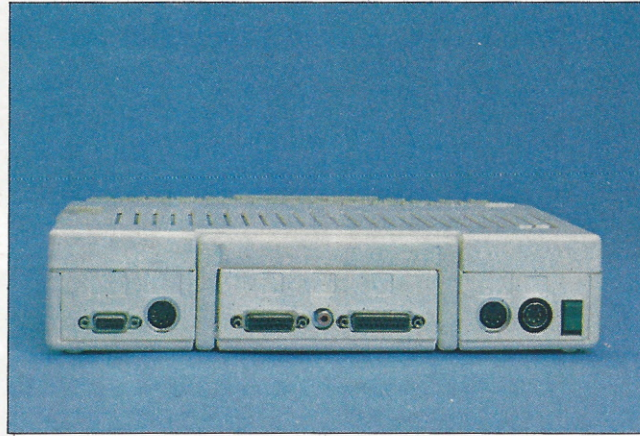


The IIc includes a port for the mouse that comes with MousePaint, a IIc program with that is similar to MacPaint for the Macintosh.





Touch typists will appreciate the IIc's keyboard and may want to experiment with the built-in DVORAK keyboard layout.



The IIc comes with ports for an external disk drive, a printer, a modem, a joystick, a mouse, and an 80-column display.

with beautifully saturated colors. About 10 software packages currently support the Scribe's color capabilities.

In addition to the existing base of software packages for the II, Apple has encouraged special software development for the IIc under both its operating systems, DOS 3.3 and ProDos, and the result is a series of 21 popular software packages in enhanced versions. The IIc version of Bank Street Writer from Broderbund, for example, is the first version of that popular word processor to offer an 80-column display and a mouse interface. In the educational area, Stickybear Shapes from Weekly Reader Family Software takes advantage of the 128k available under Apple's new operating system, ProDos, and uses the double high-resolution mode of the IIc to do animation. On the personal productivity end, PFS:FILE and PFS:REPORT include an automatic data-entry feature exclusive to the IIc version, while Financial Cookbook from Electronic Arts accepts commands from either the keyboard or the optional AppleMouse. AppleWorks, the integrated personal productivity package first available in April, is joined by Apple Access II, Apple's venerable old communications package redesigned to run on ProDos and use the interface conventions of Apple Works.

### *Placing the IIc*

The IIc will certainly take on IBM's PCjr in the battle of the serious home computers, and it will doubtless be chosen by many people who would have formerly bought the IIe. And yet another way to throw light on the IIc is to compare it to Apple's own Macintosh.

The Mac and the IIc share a number of traits. Both were designed to overcome a novice's computerphobia. Like Mac, the IIc is an appliance—a self-contained, closed box—that sacrifices flexibility to keep manufacturing costs down, yet has enough capability built in to satisfy most computing needs.

When the IIc tries to emulate the Macintosh, however, the reason Mac costs more becomes apparent. ApplePaint, a program for the IIc, was patterned by author Bill Budge after Macintosh's MacPaint. ApplePaint manages to capture some of the magic of MacPaint, but ultimately falls short. The screen looks the same, the pull-down menus are there, the pattern fills are there, even the Fat Bits option that lets you do fine detailing is there. What's missing is the zip.

Indeed, the mouse seems much less responsive in general. Moreover, some of the really fine touches of MacPaint are missing—the scrapbook, the ability to move the drawings into another kind of document, the ability to relocate pieces of text. Yet, the fact that Budge has achieved as much as he did in ApplePaint is testimony to his programming skill. Let's face it: The IIc's 1 MHz, 8-bit processor cannot keep up with the 8 MHz, 32-bit chip in Mac.

That does not mean the II family is a technological dead end that will be replaced by the Apple 32-bit family, however—an important point to people who might hesitate to buy an Apple II, even one as attractive as the IIc, for fear of obsolescence. The 65C02 processor on which the IIc is based is part of a new family of chips that extends upward to a much more powerful version of the Apple II's 6502 brain. Eventually, Apple is expected to come out with a model based on that advanced chip that will offer two modes—one to run older Apple II software, and, at the flip of a switch, another mode that runs new software designed to take advantage of the extra power.

Given this advance in circuitry, and others yet to come, Apple may be able to extend the life of the II family indefinitely. Apple II owners can keep their chins up: fine as the IIc is, it is just an indication of Apple II's to come.

**FOR MORE INFORMATION:** APPLE COMPUTER, INC., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010.





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## THE IBM OF PORTABLE COMPUTERS

by David Gabel, Senior Editor

**T**he IBM portable computer is just that—an IBM Personal Computer you can carry around.

This computer contains no surprises. If some people thought IBM would out-IBM itself with a portable, they were wrong. It's a solid, sturdy machine. Nothing fancy, just a computer.

The portable Personal Computer is similar in appearance to other portables. It's 8" high by 17" wide by 27" deep—fairly standard dimensions. The 17" width is just enough to fasten a standard IBM keyboard in front of the screen for carrying. The height is enough to allow building in a 9" diagonal screen, which is placed on the left side of the system unit, as it is in most other portable computers. A single floppy-disk drive comes as standard equipment on the right side. You can add another floppy drive as an option. There's a storage compartment above the drive to put floppy disks for traveling—a nice touch.

The drives are half-height units—two of them will fit in the space necessary for one standard-height drive, like the ones on the IBM Personal Computer. Each drive can store 360k, so they're the same capacity as the drives on the desktop machine.

The keyboard connection on the system unit is in the middle, between the monitor and the disk drive. The slot for the cord on the keyboard is on the left side. It looks as if you'd have to disconnect the keyboard cord to snap the keyboard into the case; otherwise the cord could get kinked and fail prematurely. Officially, IBM says that if the cord is tucked into the slot provided for it on the keyboard before closing the computer, the keyboard can be secured to the system unit without disconnecting the cord and "there will be no problem."

Although they are slimline units, the floppy drives still take up a fair amount of space. In contrast to manufacturers like Compaq, IBM chose to mount the drives horizontally in the case, not vertically. This means there's no room to add a hard disk inside the case, so storage for this computer is limited to 720k, with two floppy drives. Other portables, notably the Compaq Plus and the Kaypro 10, can have hard disks installed, raising their storage capacities into the multi-megabyte range. A sales representative at an IBM Product Center says people who want the extra storage can get the expansion unit for the desktop machine and connect that unit to the portable.

This IBM computer comes with an amber monitor which has brightness and contrast controls mounted on the front of the system unit for easy adjustment. Still, the monitor is difficult to read. It requires constant control adjustment to improve the picture. When it was set so normal characters looked right, the higher intensity characters fairly blazed from the screen. It's possible that the

trouble came from ambient light that was too intense. The character set on the computer screen is the standard IBM character set—but it appears smaller because of the 9" monitor instead of a 12" model.

The IBM portable computer, like the Compaq portables, comes with a built-in color graphics adaptor. So you get graphics on the built-in amber monitor or you can connect a color monitor to view color graphics.

When you're ready to move the portable computer, you first have to disconnect any peripherals. Then you disconnect the keyboard and place it in the system unit. There are four spring-loaded buttons on the side of the keyboard. Two of them are connected to legs on the back, which rotate to provide a slight slant to the keyboard when you're operating the computer. The other two are on



The 8" by 17" by 27" IBM Portable features a 9" monitor, two half-height floppy disk drives and a detachable keyboard.

the front and simply push into the keyboard housing, then snap back out into holes built into the computer's case. The buttons on the rear of the keyboard work the same way. Tucking the keyboard into the system unit is no easier or harder than it is on other portables.

After the keyboard is snapped into place, the back of the computer can be closed. There's an accordion-fold door on the top which closes to conceal all the I/O-board connections. The handle swings out over this door for carrying. The computer weighs about 30 pounds.

IBM provides a tutorial program which explains many operations of the computer, including the keyboard, DOS commands, using the printer, how the control keys can perform special functions in software and the like. It uses graphics and sound to illustrate many of the points.

This computer has a standard IBM Personal Computer keyboard. The only differences are the slot cut into it for cord storage and the nameplate, which has "Portable" added. Other than that, it's a duplicate. Volumes have been written about the key placement on this keyboard, but on this portable, the keys have a break-over feel; when



## GEMS OF WISDOM

### Justifying Ellipses

Occasionally, WordStar users may want to print a series of periods in the first column of a line of text. For example, to show that they're using quoted material and need ellipses to denote omitted words. If no special commands are given, WordStar will interpret these ellipses as dot commands, and respond with a question mark flag in the right margin of the screen display.

To avoid this confusion, type non-printable print control characters in the first few columns of the line—toggle the underline switch on and then off using `^P ^S ^P ^S`—followed immediately with the ellipses. This process will print the ellipses left justified.

To see what the text will look like before it's printed, toggle the print display with `^O ^D`.

R. David Hoxie  
CARBONDALE, IL

*This Gem of Wisdom wins \$25 for R. David Hoxie. If you have an anecdote, tip, or secret to share, send it (up to 250 words) to Gems of Wisdom Editor, Personal Computing, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604.*

## GEMS OF WISDOM

### A Printing Time-Saver

I'm a WordStar user, and I often need copies of documents as enclosures with my correspondence. Copies of the same letter with different names and addresses are easy to generate using MailMerge, but exact copies of a document must be sent to the printer one at a time. The same goes for a letter I might want to copy and take to the office, since my computer is at home.

Rather than repeat the print cycle for every copy I want, I use WordStar's Merge-print command, even though I'm not merging anything. Then, instead of hitting Escape—which I would do if I were using the normal Print command—I hit Return, and am presented with several questions, one of which is "Number of copies?", which does not appear when using the Print command. I respond to the prompt with the appropriate number, and go about my business while the printer gives me all the copies I asked for. For lots of copies and/or long documents, this procedure is a real time-saver.

Ben L. Clark  
HARTWELL, GA

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## PRODUCT REVIEWS

the key approaches the bottom of the stroke, back pressure on the key diminishes radically, forcing your finger to complete the keystroke and telling your finger that the stroke has been completed.

The good feel of the keyboard makes this machine seem like a serious, business-oriented product. The rest of the computer's appearance adds weight to this impression. There is a look of competence about it, consistent with other IBM product designs.

Nevertheless, a question persists: Does the world need another portable computer? IBM is, interestingly enough, late in coming to this segment of the market it created. Will people who would otherwise have bought a Compaq, a Hyperion, a Corona portable or any of the other multitudes of IBM-compatible portables, buy an IBM portable instead? On balance, the decision will probably be based on two variables.

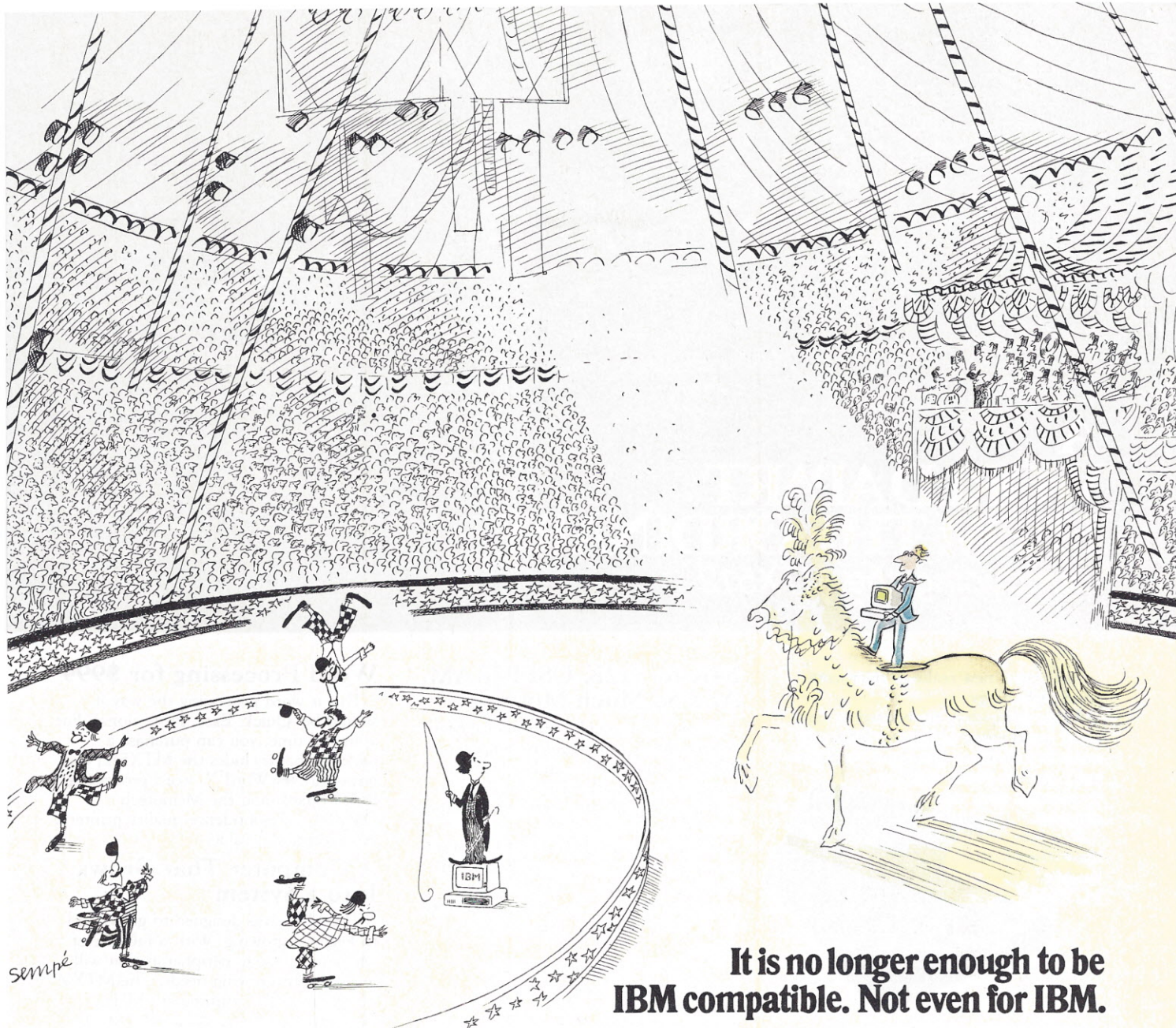
The first, of course, is price. The IBM machine costs \$2795 with one disk drive, 256k of RAM memory and a cloth carrying bag. It's arguable that serious business use requires two disk drives, so add \$425 for a second drive, for a total of \$3220. Then you have to add DOS 2.1, necessary to control the slimline disk drives, for \$65. This brings the total for a useable machine to \$3285. A Compaq computer can be bought from the dealer in a version that includes two disk drives and 256k of RAM and DOS for \$2995.

That's not really an oranges-to-oranges comparison, however. To make the comparison complete, add \$75 to the Compaq price for a carrying bag and add \$185 to include a 12-month limited warranty, which the IBM portable carries. That brings the Compaq's price to \$3255. But the Compaq comes with a parallel printer port as standard equipment; add \$150 to the price of the IBM Portable computer for a parallel printer port and the price comes out to \$3435. That's a difference of \$180, which is less than 10 percent of the base price of either machine. (I'm using Compaq for comparison because of the widely held perception that this computer is the most compatible of the compatible portables.) Other portable computers' prices vary somewhat from those of the Compaq. This price comparison merely points out that cost differences aren't necessarily a valid consideration.

The other reason to buy or not is software compatibility. This computer *will* run IBM software, while compatible computers *may*. Most software developers generate their IBM-compatible software products for IBM computers first, so it's likely that most third party products will run on this machine. IBM-compatible products vary in their degree of compatibility, so users who want to be sure that they can run IBM software may be swung to the IBM portable and away from the compatible portables.

**FOR MORE INFORMATION:** IBM CORPORATION, 1000 N.W. 51st Street, Boca Raton, FL 33432; (1-800) 447-4700.





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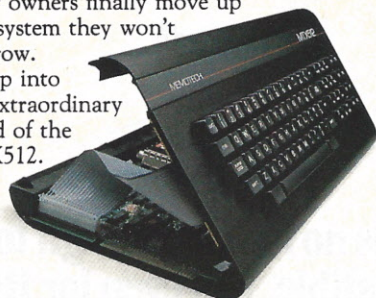
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## THE HP PORTABLE: POWER NO DESKTOP CAN MATCH

by James E. Fawcette, Executive Editor

If you've ever built a spreadsheet in Lotus 1-2-3 and then turned those numbers into a graph, Hewlett-Packard's new lap-sized portable computer, simply called The Portable, could show you the power these two companies have always promised. HP and Lotus have cooperated to put most of the 1-2-3 program into solid state memory. The result: When you ask for a spreadsheet it appears immediately. And instead of switching the 1-2-3 system disk for the graph disk, listening to the grating of your disk drive as it loads the program into RAM or fumbling with copy protection, just set up the graph and press a button. The graph seems to pop onto the flip-up liquid crystal display.

Ever since HP introduced its MS-DOS-compatible HP 150, people who use computers on the go have been waiting for this electronics giant to marry its ability to stuff power into calculators with the efforts of its 2000-member personal computer division. The Portable is the first of these long-awaited machines.

HP has packed 656k of memory, 272k of RAM and 384k of ROM into this 8½ pound, notebook-sized computer. The Portable (also known as the HP 110) is equipped with a 300-baud modem, a full 16-bit microprocessor, the 80C86 and enough software to do most of the work you do at your desktop machine. A built-in serial port provides access to conventional printers, while Hewlett-Packard's own HPIL bus allows The Portable to be hooked up to a battery-operated version of its ThinkJet printer.

The Portable also includes MemoMaker, a simple word processor that creates files compatible with WordStar, which means you can read them into WordStar on another computer such as the IBM Personal Computer. It also has a relatively easy-to-use communications program. Along with this you'll find PAM, HP's Personal Applications Manager, a simple, cursor-driven menu system serves as an interface between the user and MS-DOS 2.0. Screens of Help can be called up from each application and a row of labels appears across the bottom of the screen showing the current designation of the function keys—an approach more desktop software would do well to emulate. A built-in clock calendar allows you to set alarms or even write batch files that will, for instance, automatically dial The Source at 3 a.m. and send a file to someone's mailbox.

Your biggest problem will be figuring out exactly where The Portable fits into your workstyle. Is it an auxiliary computer or is The Portable the only computer you need, a machine that you'll use in the office and then pack up and take with you on a business trip?

Price will be the determining factor for some buyers. Although the final price is not yet set, Hewlett-Packard is

promising to be "aggressive"—something under \$3000. This may seem like a lot of money for a portable, but you get true desktop power and a good amount of software already installed in the machine and ready to use.

On the other hand, the display will be the limiting factor for some people. This LCD handles a full 16 lines of text and graphics with sharp, crisp images and it belies the long-held belief that LCD's are inherently slow. But then again, no liquid crystal display matches the legibility and utility of even an average monochrome CRT.

You'll find that the angle at which you look at the screen is key to how well you like this display. If you use



The Portable weighs 8½ lbs. and features a flip-up liquid crystal display and Lotus 1-2-3 in ROM.

your personal computer less than an hour a day the resolution may be adequate—this may be the only computer you need. If you're a heavy personal computer user then you'll probably want to consider The Portable as a secondary computer for yourself or your office at large. If the display doesn't bother you, then this computer may still be all you need.

The Portable does *not* include a floppy disk drive. You can buy a battery-operated, external drive that uses 3½" Sony microfloppies. But HP has designed a board that plugs into an IBM Personal Computer or an HP 150 personal computer, connecting The Portable to either machine. The Portable can then take over the larger computer's drives, display and accessories, using them as if they were a part of The Portable itself.

If the larger machine is a part of Hewlett-Packard's HPIL network, The Portable can access any piece of hardware on the net. One limitation, however, comes in graphics; only text created on The Portable can be displayed on the desktop it is hooked to, although graphics



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Week of Mar. 7, 1983.	Lotus 1-2-3. #1.
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Week of Mar. 21, 1983.	Lotus 1-2-3. #1.
Week of Mar. 28, 1983.	Lotus 1-2-3. #1.
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Week of Apr. 11, 1983.	Lotus 1-2-3. #1.
Week of Apr. 18, 1983.	Lotus 1-2-3. #1.
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Week of May 23, 1983.	Lotus 1-2-3. #1.
Week of May 30, 1983.	Lotus 1-2-3. #1.
Week of Jun. 6, 1983.	Lotus 1-2-3. #1.
Week of Jun. 13, 1983.	Lotus 1-2-3. #1.
Week of Jun. 20, 1983.	Lotus 1-2-3. #1.
Week of Jun. 27, 1983.	Lotus 1-2-3. #1.
Week of Jul. 4, 1983.	Lotus 1-2-3. #1.
Week of Jul. 11, 1983.	Lotus 1-2-3. #1.
Week of Jul. 18, 1983.	Lotus 1-2-3. #1.
Week of Jul. 25, 1983.	Lotus 1-2-3. #1.
Week of Aug. 1, 1983.	Lotus 1-2-3. #1.
Week of Aug. 8, 1983.	Lotus 1-2-3. #1.
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Week of Aug. 22, 1983.	Lotus 1-2-3. #1.
Week of Aug. 29, 1983.	Lotus 1-2-3. #1.
Week of Sept. 5, 1983.	Lotus 1-2-3. #1.
Week of Sept. 12, 1983.	Lotus 1-2-3. #1.
Week of Sept. 19, 1983.	Lotus 1-2-3. #1.
Week of Sept. 26, 1983.	Lotus 1-2-3. #1.
Week of Oct. 3, 1983.	Lotus 1-2-3. #1.
Week of Oct. 10, 1983.	Lotus 1-2-3. #1.
Week of Oct. 17, 1983.	Lotus 1-2-3. #1.
Week of Oct. 24, 1983.	Lotus 1-2-3. #1.
Week of Oct. 31, 1983.	Lotus 1-2-3. #1.
Week of Nov. 7, 1983.	Lotus 1-2-3. #1.
Week of Nov. 14, 1983.	Lotus 1-2-3. #1.
Week of Nov. 21, 1983.	Lotus 1-2-3. #1.
Week of Nov. 28, 1983.	Lotus 1-2-3. #1.
Week of Dec. 5, 1983.	Lotus 1-2-3. #1.
Week of Dec. 12, 1983.	Lotus 1-2-3. #1.
Week of Dec. 19, 1983.	Lotus 1-2-3. #1.
Week of Dec. 26, 1983.	Lotus 1-2-3. #1.
Week of Jan. 2, 1984.	Lotus 1-2-3. #1.
Week of Jan. 9, 1984.	Lotus 1-2-3. #1.
Week of Jan. 16, 1984.	Lotus 1-2-3. #1.
Week of Jan. 23, 1984.	Lotus 1-2-3. #1.

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Optional peripherals to The Portable include a battery-operated, external disk drive and HP's ThinkJet printer.



The Portable can do more than just exchange data with an IBM Personal Computer—it can use its disk drives and monitor.

files can be readily transferred directly to disk.

Still, many users will find that the laptop computer is good enough on its own, thanks to the electronic disk. Computer enthusiasts have used electronic, or RAM disks for years to speed their machine's access to files. Basically, the software treats the RAM as a floppy, loading multiple files and programs into solid state memory, then accessing them through the operating system's directory. Now, HP has built this capability into its portable.

HP claims that the average executive creates about 60k of files in a week. If so, the average executive could travel for three to four weeks, leaving all his files in RAM, then downloading them over his modem to his office machine. With the interconnection board the files could be transferred directly through the desktop's disk drives.

In practice, the large memory of The Portable proved to be more than adequate for fairly heavy use. Some short memos and articles, a large spreadsheet, an amortization schedule using a 1-2-3 macro that was about 40-odd lines long, all fit into RAM. The machine was used constructively for day-to-day work without a disk drive.

At this point anyone who has labored for hours over a proposal or a spreadsheet only to have it vanish when the power went out, is probably cringing. Who would dare put hours of work into RAM and then leave it there waiting for catastrophe to strike, for the batteries to run out or your in-law to toggle the on-off switch just to see what it does? HP has the answer. Part of the marvel of this machine is that it never turns off. A small amount of power is always furnished to the memory keeping it from losing its contents. A line on the opening PAM menu display tells you what percent of battery power you have left. When the batteries get down to 20 percent the machine warns you with a blinking sector of the display. Finally, if you manage to run the batteries down to five percent of full charge the machine refuses to allow you to enter any more data, using its batteries only to maintain

memory. If you're really laggard about recharging the machine, HP says it can store data for a full month in this state. The display does turn off when you stop using the machine for a few minutes, a period you can adjust. Recharging can be done overnight.

One surprise bonus from having the machine constantly on is the ability to quit in the middle of a file. Open the machine up an hour, or a week later and start right where you left off. No storing the file to disk and then later turning the machine on, rebooting the operating system, loading the program, calling up the file, searching for the last entry—and then starting back to work. Just close the lid, reopen it and you're back to work.

### *A glitch or two*

There are a number of minor, but annoying glitches. Procedures for saving files from the MemoMaker are somewhat ambiguous. And although there are ample Help screens, some are truly helpful while others are little more than labels on already self-evident function keys. While the keyboard layout and use of the function keys are both excellent, the touch on the prototype we tried was extremely stiff.

Printing graphics isn't all it should be. Although enough of 1-2-3 is stored in ROM to produce graphics, the print graph routines apparently aren't. You can get around this by configuring the function keys to dump the screen. Using the portable ThinkJet, HP's excellent new printer, for instance, you can dump the screen to get a literal representation of the display, but without control over typefaces, headers, footers and other fine points that Lotus normally excels at.

Still, HP's The Portable is a strong, innovative entry filling a gaping hole between low-end, notebook-like computers and extremely expensive, high-end portables.

**FOR MORE INFORMATION:** HEWLETT-PACKARD CO., 11000 Wolfe Rd., Cupertino, CA 95014; (800) 367-4772.



## PRODUCT REVIEWS

### POWERFUL FRAMEWORK SQUEEZES INTO CONVENTIONAL IBM PERSONAL COMPUTER

by James E. Fawcette, Executive Editor

**W**hen a "powerful new integrated package" is announced these days it's hardly news—we've all become so jaded by the rapid progress in personal computer software.

Sure, you say, I'd like to use software that integrates word processing, spreadsheets and graphics—if I had 512k in my IBM Personal Computer, a color graphics board, perhaps a mouse and I wanted to flip floppy disks in and out of my machine like a champion Frisbee player. If you had all the hardware the integrated package required you might be willing to take the time to learn its 300-plus commands. But in the meantime, you'd probably prefer to stick with the spreadsheet and word processor already in use, rather than make the investment of time and money to switch to the new program.

If you're that pragmatic, then Ashton-Tate's Framework may be the package you've been waiting for. Framework (\$695) promises to change the criteria integrated software is judged by, both because of its performance and its unique outline-based approach to integration and organization when it becomes available in July.

First, it's powerful, just like other integrated packages such as Symphony and Ovation. On their own, Framework's word processor and spreadsheet are excellent. Then add business graphics, limited but functional data base capability and the ability to program macros—most of the features integrated software should offer.

Unlike such direct competitors as Symphony and Ovation, Framework squeezes all this power into one floppy disk that can run in an IBM Personal Computer or close compatible with as little as 256k of RAM.

Framework promises integrated power in a relatively nominal machine with no additional memory board or

expensive graphics card and monitor. Framework can take advantage of larger memory to handle larger documents and work faster.

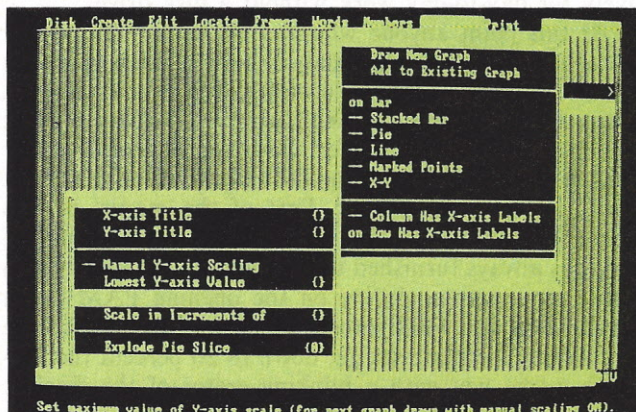
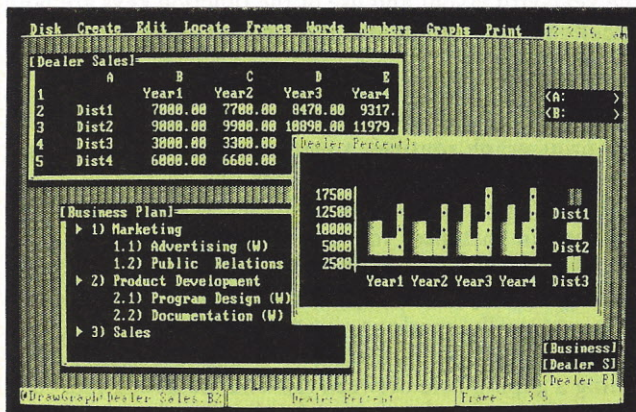
The final version of Framework was not ready in time for this review, in fact several design iterations remain before release in July. We were able to spend some time with a version that ran in 384k and get several demonstrations from Robert Carr, chairman of Forefront, the firm that developed Framework for Ashton-Tate.

The version we saw was remarkably fast, in part because the entire program—spreadsheet, word processor, data base, the user's active files—is right there in RAM. Carr explained that this will not be possible in 256k systems. Running Framework on a computer with 256k will require use of overlays. In other words, part of the program will be loaded into the computer's memory when the program is booted and other sections will be called in from the floppy disk only when needed. When new sections are called in they replace portions already in memory. This means Framework will be slower when running on a 256k system. But Carr says this will only cause significant delays when changing between modes.

Also, document size is affected by the amount of memory you have. In 256k, Forefront estimates that the final version of the program will be able to store a 33-page double-spaced document, a 4000 cell spreadsheet or a data base with 500 records. In 384k this jumps to 75 pages of text or 9120 spreadsheet cells, while in 512k a monster spreadsheet of 14,240 cells or an entire 117-page document could be held in RAM. This is based on a conservative assumption that a page of text holds 300 words of 10 characters each.

#### Integration through outlining

This cold, quantitative description may be necessary to understanding Framework. But it can't convey the essence of this truly innovative program.



Framework can display multiple frames, such as a spreadsheet, a graph and a word processing document, simultaneously (left). These frames are set up from menus that can be accessed with simple keystroke combinations.



With Framework, personal computers at last will begin to realize the promise of integrated software. The transition from one mode to another, the change from working in a spreadsheet to drafting a chapter of a business plan, to graphing quarterly sales results—and then putting all of these elements together in one document—is as seamless and easy as has yet been achieved.

Framework begins with the concept of an outline. On the surface, Framework's outline works much like ThinkTank, a software breakthrough from Living VideoText of Palo Alto, CA. Both allow you to display an outline for an entire project on-screen then call up information for any outline item by highlighting the item. In ThinkTank, the outline can contain notes, providing an effective way to organize thoughts. The concept is expanded in Framework. Create an outline of a business plan, select a chapter heading and start entering a 30-, 40- or 50-page document. Close the document, open another heading, perhaps entitled Delivery Projections, and create a spreadsheet. Need a pie chart for a section of that spreadsheet? It's only a few keystrokes away. Define the range to be graphed using English descriptions or cell locations as you prefer and it appears, on a color or monochrome display. Need a data base of employees in your business plan? Create one under another outline heading.

Opening a line in the outline causes what Ashton-Tate calls a "frame" to appear on the screen. Frames look suspiciously like windows. Whatever you call them they are effectively implemented. Several frames can be displayed simultaneously, but only one can process data at a time. Frames can be nested within each other or several frames stored side-by-side in one outside frame.

Finally, you can print out this entire business plan with sections of spreadsheets and graphs on pages with text.

If Framework's integration is smooth, the whole is only as good as its separate parts allow it to be. Here, too, Framework delivers.

The word processor and spreadsheet are excellent. Pull-down menus, somewhat similar to those used on the Apple Macintosh, quickly display and allow selection of options. Italics and boldface are shown on-screen and individual paragraphs can be reformatted—in either the word processor *or* the spreadsheet.

Spreadsheet column and row labels can be printed in bold or italics. This capability can be used to make significant figures stand out. Or you can finally start entering comments and explanations into your spreadsheets, the way you know you should be.

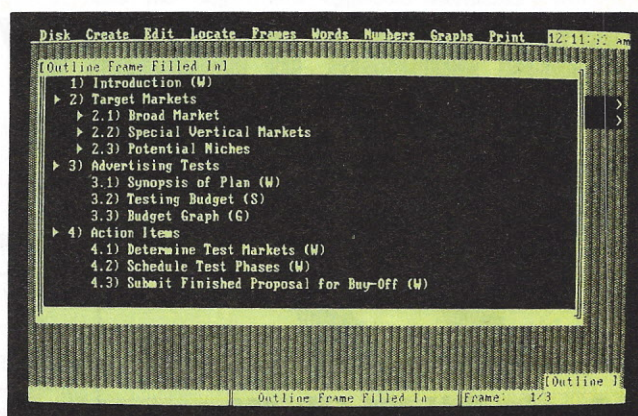
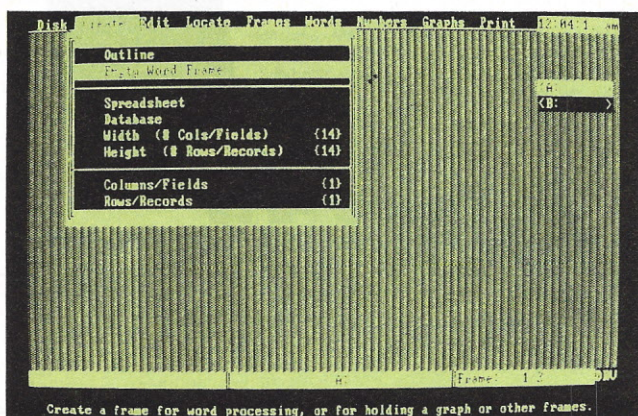
The spreadsheet calculates rapidly. Perhaps more important, Framework allows you to move quickly throughout the spreadsheet. Large spreadsheets can be readily handled. That's because the outline structure of Framework helps you organize your work and because cell references can be made from a spreadsheet in one outline item to another spreadsheet contained under a separate outline item.

Word processing features also include the ability to create multiple-line headers and footers, something several of the best-selling, stand-alone word processors can't manage. You can even set Framework up to print the current date in the header for each page.

Pages are *not* displayed exactly as they will be printed, but there are some powerful formatting features. For instance, one frame on the display might include a lengthy document, while another frame below it displays a spreadsheet. The spreadsheet will print following the document as shown, with an indentation if desired. But the document in the upper frame might be many pages long, so it obviously can't be displayed at one time. Instead, you would scroll through the document within its frame.

### Macros multiply power

Anyone familiar with Lotus 1-2-3 knows how powerful its macro capability is. For those who aren't, macros have



Outlines can be quickly set up (left) and displayed (right) within Framework to coordinate spreadsheets, chapters and graphics in one report. The report can then be printed with graphics and spreadsheets integrated with text.



## PRODUCT REVIEWS

two basic functions: The simpler use is to store multiple keystrokes, saving typing time; the more powerful application is to serve as a mini-programming language. Lotus macros can be set up to perform fairly complex operations, awaiting entry of variables. For instance, you can set up a full loan amortization schedule, with on-screen menus that prompt you to enter different interest rates then automatically calculates the spreadsheet.

Framework has expanded on the macro concept. In 1-2-3, macros are stored within a cell of any given spreadsheet and thus work only on that spreadsheet. If you want to build another spreadsheet and use the same macros you call up the original, erase the data cells and store it under a new name. Framework allows you to create a separate file of macros and call them up to work on any given file. It also allows you to automatically capture keystrokes as you use them, a simple shortcut.

Still more powerful is a programming language built into Framework. Even users who don't want to bother with programming should benefit from Fred, as the lan-

guage is called, because Ashton-Tate is encouraging third-party developers to create Framework-compatible products using Fred. Utilities furnished with Framework will include items built using macros or Fred.

A promised group of utilities should help overcome one of Framework's possible competitive disadvantages, lack of integrated communications. Squeezing all of Framework into one disk and 256k or so of RAM was challenging enough without including communications; a typical communications package can take 120k. Forefront's answer is to allow users to call up PC/MS-DOS commands through a frame. You could then access a program such as Crosstalk or Transend, transfer files into Framework and process them.

Macros and the Fred language promise that Framework will not only be a potent business productivity tool, but that it will grow in significance as more and more tools are developed for it.

**FOR MORE INFORMATION:** ASHTON-TATE, 10150 West Jefferson Blvd., Culver City, CA 90230; (213) 204-5570.

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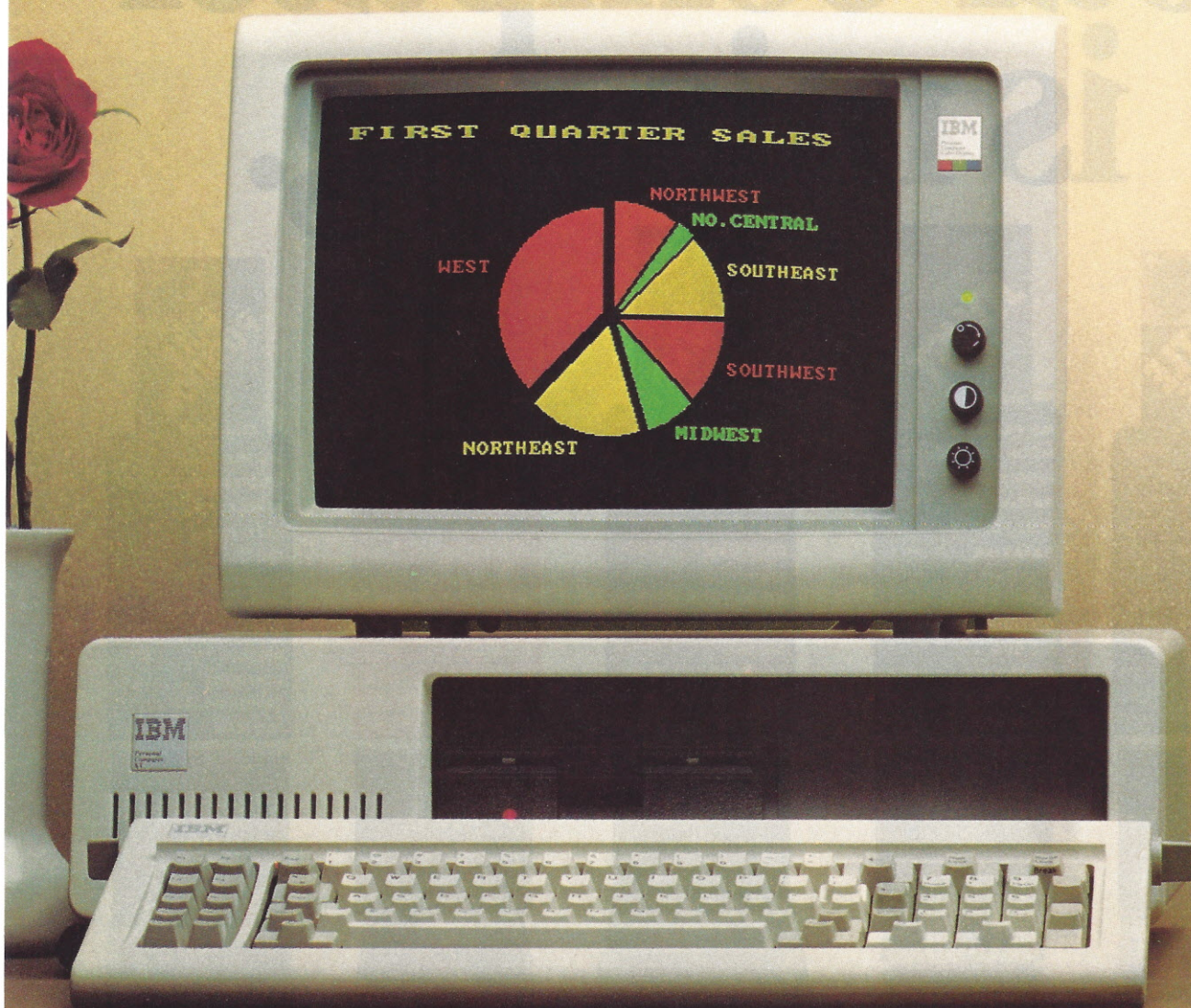
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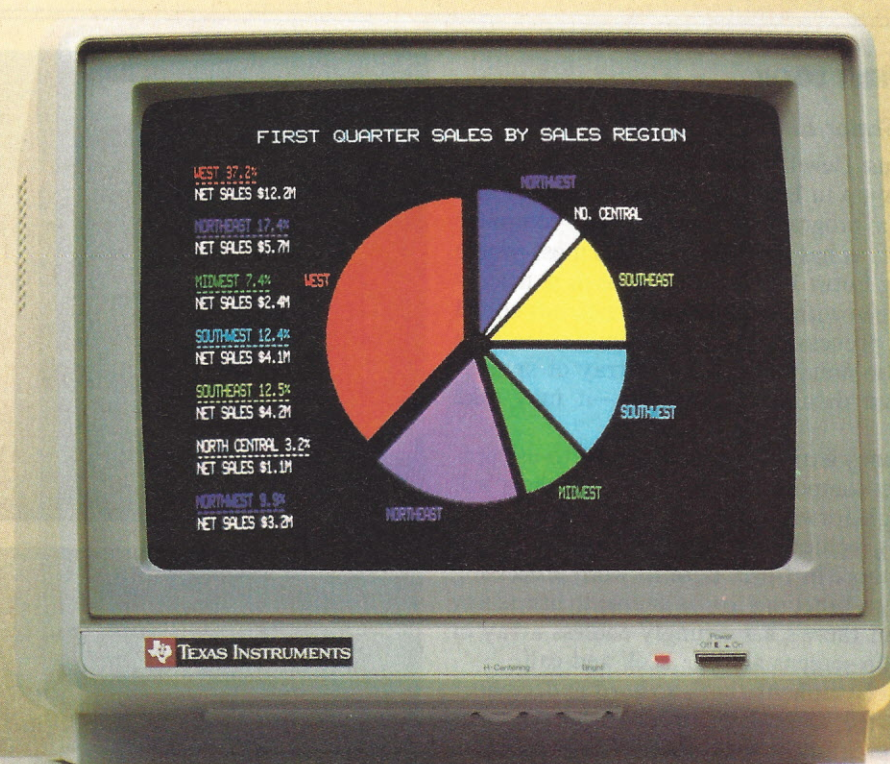
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## SYMPHONY: A FIRST LOOK

by Paul Bonner, Senior Editor

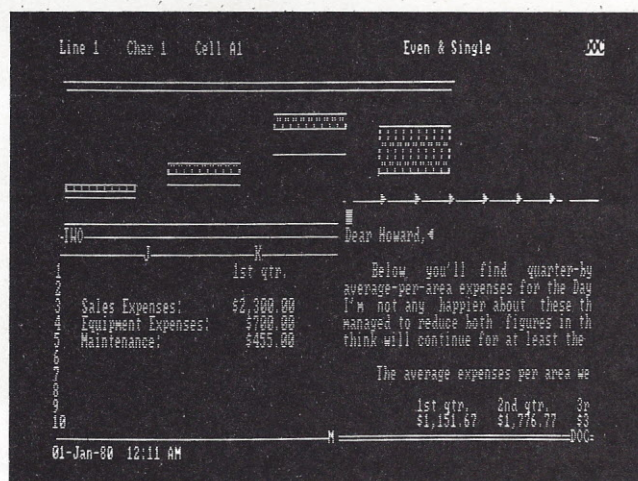
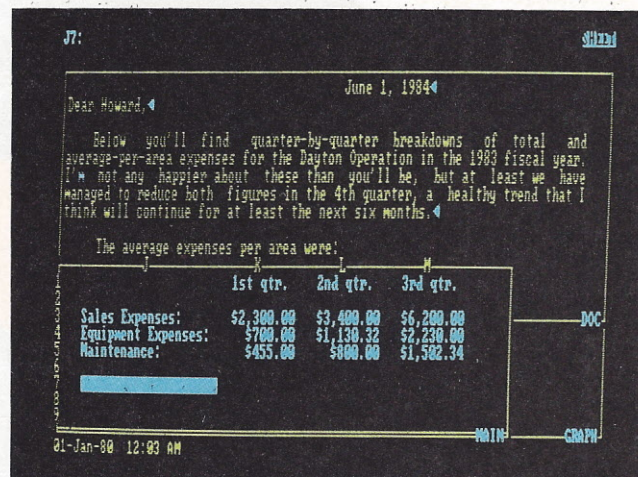
**S**ymphony, Lotus Development Corporation's much-heralded follow-up to Lotus 1-2-3, is as complex and all-encompassing a program as the personal computer market has seen. If, as has been said, it takes most people six months of using Lotus 1-2-3 on a daily basis to discover its real power, then with Symphony—which has added impressive word processing and telecommunications functions while also enhancing 1-2-3's array of spreadsheet, graphics and data base functions—it may take years.

And yet, Symphony is an exceptionally easy-to-use program, at least in its component parts. Its spreadsheet will seem quite straightforward to anyone familiar with spreadsheets. Its graphics and data base functions are easier to use than those in 1-2-3. Both its word processing and communications functions are as simple to use as any on the market, and there's a seemingly endless array of context-related help screens at your beck and call.

What is it about Symphony that's so hard to decipher? The answer is buried somewhere in what the people at Lotus call "the spreadsheet metaphor." Chris Morgan, vice president of communications at Lotus, explains that: "The majority of Symphony revolves around the spreadsheet . . . if you use Symphony for word processing, at the top of the screen you'll see the line number, the character number and also the spreadsheet cell. We did that intentionally so that you have a common data structure. You can create a document that has a formula in it to generate a useful number in the document. If you're doing a data base, data base information actually resides in cells of the spreadsheet, even though you get to it through a data base form. We've disguised the spreadsheet so that the person using the data base sees the form and doesn't really see where the data is stored. Another example is communications. Terminal emulation is really sitting on top of the spreadsheet, so that when you capture information through communications you can instantly change the window into a spreadsheet and start analyzing it or into a document window and start editing a report. Metaphor is a highfalutin term . . . all we're saying is that most of Symphony revolves around the spread sheet."

### Windows on a metaphor

To understand how the spreadsheet metaphor is reflected in Symphony, you have to understand windows. The original VisiCalc was, in one sense, a windowing environment in that the screen display showed only a portion of a potentially huge spreadsheet. The same, of course, is true of any word processor. The next step in windowing came with products such as VisiOn, Quarterdeck DesQ and Apple's Lisa and Macintosh, which allow you to run



With a standard IBM color graphics adaptor you have the choice of displays of color text and graphics windows (top), or a shared display of black and white windows (bottom).

several different kinds of programs at one time in your computer, devoting a portion of the screen to each.

With Symphony, Lotus has pushed the concept of windowing even further. True, you can produce multiple windows—one for word processing, one for spreadsheeting, one for graphics display, one for communications, etc.—on the screen at one time, just as you can with any of those products. But you can also change the nature of any of those windows so that your word processing document becomes a spreadsheet or your data base form becomes a word processing document and so on.

The capability to change the nature of a window within Symphony puts enormous power at your fingertips. Quite simply, it means that you have all the power of a spreadsheet and data base available while you're doing word processing, or all the power of a word processor, spreadsheet and communications package available when you're



using your data base. It's as if in the middle of writing a letter with a word processor you could hit a key and without changing your letter at all have it displayed within a spreadsheet—and then hit another key and have your letter in a data base with all of that program's capabilities available—and then with another keystroke return to the word processor with your letter not only intact but enhanced with data you chose to cull from your spreadsheet and data base and include in your document.

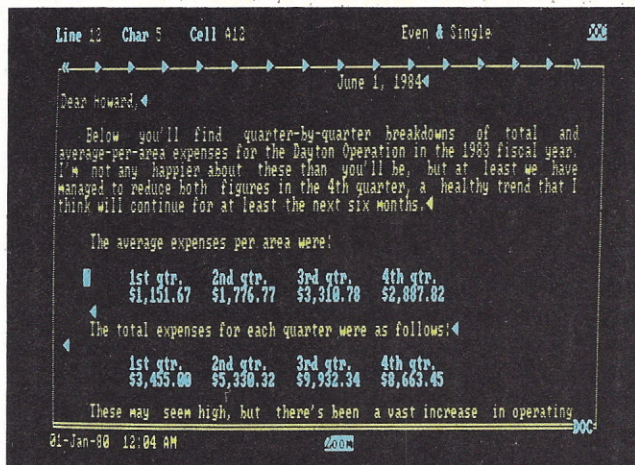
Better yet, that data would not be static—the portion of the spreadsheet or data base you picked up would change to reflect any changes you later made in the spreadsheet or the data base. Add to this capability Symphony's power to view several applications at once in the windows Symphony gives you, and the ability to zoom in on an application and hide the other windows when you so desire, plus a command language equal in power to most forms of BASIC, and you have a very powerful package.

You also have a package that will not be mastered overnight. Because as easy to use as each application within Symphony is when viewed apart from the others, the power that comes from using several applications together is too alluring to pass up and learning to use them together takes time. In fact, to really make use of the power of any of Symphony's applications—with the exception of the spreadsheet itself—you must use them together. The spreadsheet functions in Symphony, like those in Lotus 1-2-3, are state-of-the-art; they would be more than adequate as a dedicated spreadsheet package (although they too are certainly enhanced by the presence and accessibility of the other applications). But the other Symphony applications really depend for their power on their level of integration. Let's look at them one by one and then examine how Symphony ties them all together.

### The spreadsheet

The spreadsheet portion of Symphony strongly resembles that of Lotus 1-2-3, although it has received notable enhancements. Most Lotus 1-2-3 worksheets can be used with Symphony without any difficulty—the only obvious exceptions being worksheets that make use of 1-2-3's macro language. Renamed the "command language" in Symphony, the macro capability has been changed considerably. However, Lotus promises a utility routine to translate 1-2-3 macros into Symphony command language. (The changes in the command language both simplify and enhance 1-2-3's macro language. In order to simplify the use of macros, Symphony has a Learn mode which, when activated, automatically records your keystrokes in a macro. The enhancements include numerous error-trapping routines to allow template developers or those with a programming bent to create bug-free, auto-running applications within the Symphony environment.)

The command structure in the Symphony spreadsheet



In this Symphony document window the white text represents data picked up from a spreadsheet window.

also closely resembles that of 1-2-3. As in 1-2-3, pressing the slash key will bring up a menu of spreadsheet functions. However, the contents of the menu are somewhat different since some functions available in any Symphony application—such as File, Print and Window functions—have been moved to a System menu that's accessed by pressing F10. To make the menuing system more convenient, the local (i.e. spreadsheet) menu can also be accessed by pressing F9.

The most notable enhancement in the Symphony spreadsheet is a vastly increased number of "@" functions, including a full range of string-manipulation functions. A string, as programming devotees will know, is a series of characters, numbers, letters, etc. "Symphony" is a string, as is "4, 5, 6, pick up sticks." The string functions in Symphony are more extensive than those in many programming languages. They include: @ASCII (which returns the ASCII value of the first character of a string); @CHR (returns the ASCII character represented by a number); @LENGTH (returns the length of a string); @MID @RIGHT and @LEFT (which return a specified number of characters starting at the beginning, end or middle of a string); @LOWER and @UPPER (to convert all the characters in a string to lower or upper case respectively); @VALUE (to convert a label such as 3/8 into a number—.375 in this case); and others.

Within the spreadsheet itself, these functions will be most often of use to people who want to develop menu-driven or automated applications using the Symphony command language. However, they should also be extremely useful to even the casual user who wishes to manipulate data from a data base, communications or word processing window.

Symphony's graphics resemble those of Lotus 1-2-3, although several additional graph styles have been added



## PRODUCT REVIEWS

to 1-2-3's array of bar, stacked-bar, X-Y, pie and line graphs, including exploded pies, high-low-open-close charts (for stock market data) and area graphs. In addition, you can create and display several different graphs at once due to Symphony's windowing capability. Graph definition has been simplified by the use of a settings sheet for each graph you wish to define.

If there's a problem with Symphony's graphics, it's that their quality is greatly dependent upon your hardware configuration. With the IBM color graphics adaptor, for instance, you have to choose whether you want to display black and white graph windows on the same screen as text windows or switch between text windows and color graphics windows (by pressing F6). A high-resolution color board, such as the ColorPlus board from Plantronics, is necessary to actually display color graphics windows and text windows simultaneously. (A high-resolution graphics card has the additional benefit of making Symphony's ragged-edged, oval pie charts—as unappealing as those in Lotus 1-2-3—look like smooth, round pies.)

Data base management was the poor sister of the applications that Lotus 1-2-3 promised. It was powerful in terms of its sorting capability, and certainly, by virtue of being linked to the 1-2-3 spreadsheet, it had all the math functions you could want. But it lacked what almost any viable data base program must include: forms-oriented data entry. There was no way to set up an attractive data-entry form and have the program automatically file away your data. In fact, it was hard to tell that you were working in a data base at all because all the data base commands were accessed from within the spreadsheet.

Symphony solves this problem. The Symphony data base is still not the most friendly data base on the market, but it is very much easier to use. To set up a data base in Symphony you simply list the items you want included, specifying default attributes (field size and type) for each and, if you wish, special attributes for some. Then Symphony generates a data entry form. It's not the most elegant form in the world—all the data entry fields are listed down the left side of the screen—but it's a lot easier to use than 1-2-3's data base and it uses recognizable data base commands such as Sort, Add Records, Delete Records and so on. And when you review records they are displayed, one at a time, on the data base entry form. In other words, you feel as if you're using a data base, instead of performing a highly complicated operation on a spreadsheet. In addition, you can manipulate the arrangement of items on the data entry form to make it more attractive or useful. However, to do very much in that area requires some study of the way Symphony creates and stores a data base. It's not hard to figure out, but it will take some time.

At the most simplistic level, all data base functions can be broken down into adding/deleting records and finding

Editing Record 4 of 5 (Match 1 of 2)  
Enter Client's Full Name

Name	John Smith
Street	445 West End Avenue
City	New York
State	NY
Zip	33023
Phone (212)	555-9999
AutoFund Shares	50
AutoFund Value	5175
TechFund Shares	25
TechFund Value	2175
IndusFund Shares	25
IndusFund Value	4800
BlueChip Shares	0
BlueChip Value	0
GrowFund Shares	20
GrowFund Value	4500

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Symphony features several enhancements of Lotus 1-2-3's data base functions including generating data entry and report forms.

the records you want. Symphony makes all of these easy, and—since your search criteria can include any of the spreadsheet's math or string functions—it gives you an exceptionally powerful tool for finding records. Thus, Lotus has made data base management a strong part of the Symphony package.

Symphony's word processing provides most basic word processing functions plus a few frills. Styled after the Wang dedicated word processor, it allows you to insert and delete text, search for and replace text, move text, copy text, set up multiple format lines within a document, each specifying line spacing, form of justification (left, right, centered or full, tab stops and margins), print or save to disk all or part of a document and do mail merge operations (through a combination of data base, spreadsheet and word processing commands). The only seemingly essential word processing function not found in Symphony's word processor (and it's hard to imagine how it could be left out, except as an oversight), is the ability to get a count of the number of words and/or characters in your document. Actually, both counts can be derived, but you'd have to use the spreadsheet to do so. An actual word count would involve some pretty fancy programming.

Despite the oversight (which may only be of concern to professional writers), Symphony's word processing is more than acceptable. It's remarkably easy to use and no doubt will be powerful enough to meet many people's word processing needs. Still, it's not WordStar. The list of features found in the top stand-alone word processors that are not found in Symphony is probably as long as that of those it has, including hyphenation, foot-noting, index generation, a spelling checker, multiple fonts and the ability to imbed printer-control characters in your text. On the other hand, including a section of a spreadsheet or data base in the middle of a report with WordStar takes



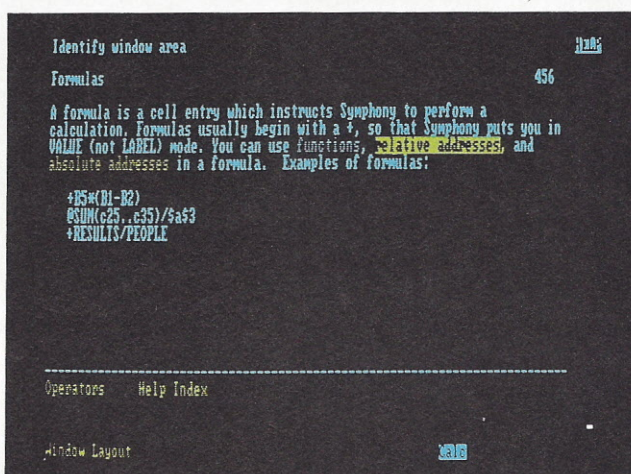
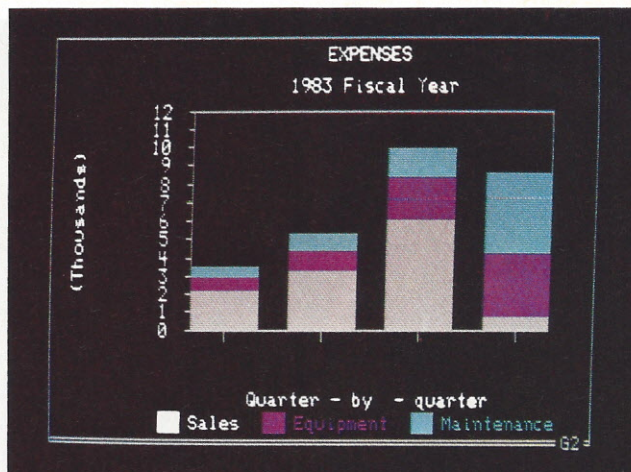
either a lot of keystroke entry or some real file-manipulation magic. Lotus seems to be betting that the word processing features it has included with Symphony are sufficient for the user who wishes to generate an occasional report or memo and that the power derived from their integration with the other applications in Symphony will make up for the features that aren't there. It's probably a safe bet. Although Symphony can't compare to WordStar on a feature-by-feature basis, the person who uses word processing once a week or once a month will find Symphony's word processing by far the superior of the two on the basis of ease-of-use alone. In the time it takes the occasional WordStar user to remember only a few of its commands, the Symphony user can generate a finished report.

Then there is communication. Symphony's communication features include full terminal emulation, automatic dial-up and log-on to remote data bases, the ability to dump information you've downloaded into a spreadsheet or data base, the ability to transfer files and the ability to store multiple sets of communications parameters, log-on sequences and so forth on disk (for instance, one for Dow Jones, one for CompuServe and so on). It's a simple-to-use, powerful, little communications package.

### The big picture

Symphony is aptly titled. The functionality of each of its component applications, like the parts played by the various instruments in an orchestra, is acceptable. But just as the part played by the string section of a symphony orchestra is less satisfying by itself than a piece specifically written for a string quartet, so the applications within Symphony fall short when separately measured against the dBASE II's, MicroSoft Words, GraphWriters and Transends of the world. But when you add together the parts played by each of the sections of a symphonic orchestra or by each of the applications within Symphony, the result is something uniquely powerful and compelling.

It's time to return to the source of this power and this compulsion: the spreadsheet metaphor. Symphony is successful because the people at Lotus recognized that the spreadsheet has been enormously successful in recent years not because it is the ideal tool for everyone—everyone is not, after all, an accountant—but because it offered the computer user a way to store and analyze data that was more efficient and easier to use than anything that preceded it. The real meaning of the spreadsheet metaphor in Symphony is that Lotus has taken the ease-of-use and power of the spreadsheet and extended it to all the applications that people commonly use. And they've eliminated the problems of using different applications—new, difficult command structures to learn; or the inability to move data from one application to another—that kept many people from moving beyond the single applica-



The top screen shows a stacked bar graph generated from spreadsheet data. The bottom screen is one of Symphony's many context-related help screens.

tion they used the most, or the one they started with.

Of course, there's a high bottom line to Symphony. A \$695 price tag (\$200 to registered owners of 1-2-3, the details of the exchange plan were unavailable at the time of writing); a minimum requirement of 320k RAM (which leaves you less than 64k of workspace—384k or more of RAM is a much more realistic figure); and the need for a high-resolution graphics board to exploit all of Symphony's windowing capabilities. But on the other hand, Symphony includes and integrates all of the most popular productivity applications as elegantly as any system on the personal computer market. Because of that, it would be a wise choice for many people to make Symphony the first program they ever buy. It could end up being the only program they'll ever need.

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Printer Port	YES	OPTIONAL	YES	OPTIONAL
Communication Port	YES	OPTIONAL	YES	YES
MS™ DOS/BASIC®	YES	OPTIONAL	YES	OPTIONAL
System Expansion Slot	YES	YES	YES	YES
RGB and Video Port	YES	OPTIONAL	YES	OPTIONAL
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## TYING YOUR SPREADSHEET TO THE BIG BOARD

by Paul Bonner, Senior Editor

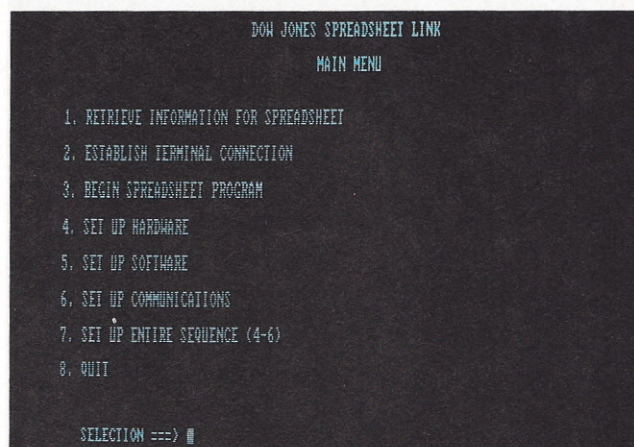
**C**onsider these points: (1) Keeping track of your stock portfolio involves manipulating a lot of numbers; (2) spreadsheet programs have been endorsed by everybody and his brother as the ultimate weapon for manipulating numbers; (3) the numbers you need to help you keep track of your stock portfolio are available to your computer through telecommunications services such as Dow Jones News/Retrieval (DJN/R).

It follows automatically that personal computer users interested in the stock market would use a spreadsheet to analyze data relevant to their portfolios after downloading that data from a telecommunications service. Maybe not.

Some do. But not as many as you would expect. Several problems get in the way: Most spreadsheets don't include telecommunications functions; the information available from the DJN/R isn't provided in any kind of standard spreadsheet format; and trying to massage the DJN/R data into a form acceptable to say, VisiCalc or Lotus 1-2-3 or MultiPlan, can be difficult. For most people, the only viable means to get stock price data into spreadsheets has been to type it in manually after downloading it from a service like DJN/R with a communications program, or after looking it up in the newspaper. And, if you're going to have to do a lot of typing and if you're not a professional stock trader, why should you spend the money to use a telecommunications service for stock prices available in any daily newspaper? Sure, the prices in a newspaper are a day old, while those available from DJN/R are only 15 minutes old, but unless you make your living on Wall Street, the need for up-to-the-minute prices isn't urgent.

On the other hand, even if you're not a professional you may have a lot of money tied up in the market and waiting until the next morning for the previous day's closing prices can lead to a lot of sleepless nights. So, maybe you would like to be able to look at market trends with your spreadsheet everyday, if there was some convenient way to do so and avoid a lot of typing. Now there is: the Dow Jones Spreadsheet Link (DJSL), from Solutions Inc. and Dow Jones & Company, Inc. The package serves as a communications link between your spreadsheet and the DJN/R service, automatically establishing a communications link (assuming that you have an auto-dial modem), retrieving information on the stocks you've requested and putting them into spreadsheet file. The IBM Personal Computer version will work with MultiPlan, VisiCalc or Lotus 1-2-3, while the Apple II version links with either MultiPlan or VisiCalc. Included with the package is a free subscription to and one-hour of free unrestricted use of the DJN/R service.

To get you started, the DJSL manual includes sample



The Dow Jones Spreadsheet Link main menu allows you to configure the software and to log on to the data base.

sessions that take you step-by-step through the process of using the program. Sample sessions are provided for each of the various system configurations and of the spreadsheets supported. For example, in the manual for the IBM version of the package, there are separate sample sessions for: systems in which both VisiCalc and DJSL are accessed from floppy disks; systems in which VisiCalc is on a floppy disk and DJSL is on a hard disk; and systems in which both VisiCalc and DJSL are stored on a hard disk. There are also sessions for MultiPlan and Lotus 1-2-3 in each of those configurations. This is a nice touch.

The DJSL disk also includes several sample templates for each of the spreadsheets supported. I worked extensively with one of them, called PORTTEMP, on a IBM Personal Computer using Lotus 1-2-3 and a Smartmodem. As supplied on the DJSL disk, this template calculates the year-to-date performance of two portfolios by comparing the current day's closing price with the closing price on the last day of the previous year. It determines the value at the end of the year, the current value, the percentage of change in value for each stock in both portfolios and then for both portfolios as a whole. The other sample templates perform functions such as calculating the present value of a portfolio, determining specific revenue and earnings information for a portfolio and determining the percent price change in the last four and the last 52 weeks, as well as net insider trading and the beta in up and down markets for each stock in a portfolio.

Each of the sample templates contain the symbols and some historical information (for instance, dummy values for yesterday's closing price) for a dozen or so stocks. After examining one, you can immediately shut down your spreadsheet program and run DJSL. The first time you do so you're taken through a configuration menu to indicate various characteristics of your system (number



## PRODUCT REVIEWS

C9: 67.5  
Enter name: xx Enter range: B5..C9

	A	B	C	D	E	F	G	H
	STOCK	U-LAST	U-BID	SHARES	CURRENT VALUE	PURCHASE PRICE	CHANGE	% CHANGE
5	U-TAN	59.875	59.500	400	23,950	14,000	9,950	71.07%
6	U-IRM	108.000	107.000	200	21,600	16,600	5,000	30.12%
7	U-ARP	50.500	50.500	500	25,250	11,000	14,250	129.53%
8	U-GE	107.500	107.500	100	10,750	10,000	750	7.50%
9	U-DJ	67.500	67.500	700	47,250	28,000	19,250	68.75%
13	TOTAL				128,800	79,600	49,200	61.81%

The highlighted data in this spreadsheet (one of the sample models provided on the disk) is the data that was actually retrieved.

of disk drives, type of modem, printer location and type, etc.). Thereafter, everytime you boot the program you are immediately taken to the main menu, where you have the option of either changing the system configuration entered previously or accessing DJN/R. If you select the latter option, the program prompts you to enter the name of your spreadsheet file—for instance, PORTTEMP.-WKS—and then after examining the spreadsheet file to determine what information it needs, automatically establishes a modem connection to DJN/R and gets that information. Since the program only retrieves the information needed for the analysis you're doing, connect time to the service is extremely brief.

Once the program has retrieved and saved the data you need, it returns you to the main menu where you're given the option of booting your spreadsheet program. Selecting that on the IBM version results in the DJSL program ending with a prompt instructing you to put your spreadsheet program in Drive A and initiate a system reboot (by pressing CTRL-ALT-DEL simultaneously). But since the program leaves you with a DOS prompt you can actually run your spreadsheet simply by putting the spreadsheet disk into Drive A and typing the name of the spreadsheet program, as in LOTUS, followed by a return.

Once you get your spreadsheet program running, you load the file for which DJSL has retrieved data and then load in another file called DJ (via a normal file load in VisiCalc, a Transfer Load in MultiPlan or a File Combine command in Lotus 1-2-3) in which DJSL stored the data it retrieved. And that's it.

In all, the sample templates are very useful since they illustrate how to structure your worksheet so that DJSL will know what information you want. Of course, it's unlikely that your portfolio will mirror the dummy portfolios that the DJSL templates include as examples, but

it's very easy to change the templates to reflect the stocks in which you're interested. In fact, within minutes of getting my first data for the PORTTEMP template I began customizing to include different stocks. I wanted to show: The actual year-to-date change in value of each stock holding and of the entire portfolio rather than just an expression of that change as a percentage value; the current data on the spreadsheet so that when I printed it I would have a way to tell one day's results from another; and to define a couple of Lotus macros to produce graphs of the changes in prices and changes in total value of the stocks I had tracked. All of which is easy if you know your way around your spreadsheet program.

Unfortunately, while the DJSL manual contains the necessary information to retrieve any information you could conceivably need, the only clues it provides as to what information you do need are the sample templates. Beyond that, you're on your own. Nor does it contain any information on how to best use your spreadsheet for portfolio analysis. So to really get the best value out of this package, you should know—or go to the trouble of researching—something about portfolio analysis and you must be proficient with your spreadsheet program. It's really not much of a problem. After all, this package is aimed at spreadsheet users so it's assumed that those users are proficient.

Those minor objections aside, DJSL is a package that does exactly what it claims—and does it well. You won't use it all day, but that's the idea: To get you the stock data you want and put it into a form with which you can work as quickly as possible. It makes following the daily progress of your portfolio easy and enjoyable.

DJSL is adaptable. However, to do all it sets out to do requires it to know exactly what equipment you're using. Hence, there are restrictions on compatible hardware and software. The Apple II version requires a 16 Sector version of VisiCalc or any version of MultiPlan compatible with DOS 3.3; an acoustic coupler or 300 or 1200 baud manual dial or auto-dial modem compatible with one of the following: Hayes Micromodem II, Hayes Smartmodem, Radio Shack TRS-80 Modem II or Novation 103/212 Smart-Cat; and an Apple Communications Card or Apple Super Serial Card.

The IBM version requires an IBM Personal Computer or XT; PC-DOS 1.1 or 2.0; VisiCalc, Multiplan, or Lotus 1-2-3; an asynchronous communications adapter; and an acoustic couple or 300 or 1200 baud manual-dial or auto-dial modem compatible with one of the following: Radio Shack TRS-80 Modem II, Hayes Smartmodem, or Novation 103/212 Smart-Cat. Both the IBM and the Apple version support serial or parallel printers. The package retails for \$249.

**FOR MORE INFORMATION:** DOW JONES SOFTWARE, P.O. Box 300, Princeton, NJ 08540; (800) 257-5114.



# Introducing the world's first complete, self-contained, 16-bit portable computer system.

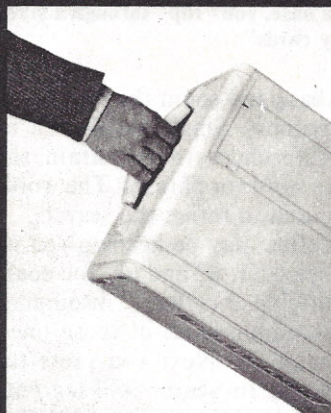
## The Panasonic® Sr. Partner with a built-in printer.

The Panasonic Sr. Partner is one of the most flexible and versatile portable computers on the market today. So there are many reasons to buy one.

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To begin with, the Sr. Partner runs IBM PC compatible programs. So you can pick from hundreds of popular programs from an existing software library. Including Lotus® 1-2-3®, Multiplan® and even Flight Simulator®.

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The Sr. Partner is an integrated system that doesn't require costly add-ons to be called complete.

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And if the Sr. Partner should ever need servicing, we have a national network of authorized service dealers.

### Over 60 Years of Dependability.

We're not one of those "here today, gone tomorrow" companies.

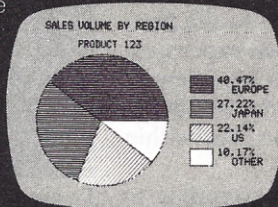
Our parent, Matsushita Electric Industrial Co., has been in business since 1918 and is one of the world's largest consumer electronics manufacturers.

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For more information about the Sr. Partner, write to: Computer Department, Panasonic Industrial Company, Division of Matsushita Electric Corporation of America,

One Panasonic Way, Secaucus, NJ 07094. Or call: (201) 392-4261.

The Panasonic Sr. Partner. It's everything you've always needed in a portable computer but never had before.



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\* Software package subject to change.

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### RESEARCH ASSISTANT ON A DISK

by Lynn Walker, Assistant Editor

**I**n-Search, a new program from Menlo Corporation, offers instant access to more than 200 on-line data bases (80 million articles and references) provided by Dialog Information Services, Inc. The program is a businessperson's answer to information retrieval that's fast, thorough and easy to learn.

In-Search's most significant feature is the ease with which it gets you up and running on Dialog. In the past, it was necessary to attend lengthy (and often expensive) seminars to learn to use Dialog's data bases proficiently. With the use of clear on-screen instructions, In-Search simplifies the process so you can search for data within minutes of opening the package.

Using In-Search is a three-step process, according to the documentation. "First you select the data base that most likely contains information to help you answer your information problem. Then you enter a search request. Dialog searches through the data base and counts the number of references that match your request. Finally, you retrieve the records and read them."

#### Getting started

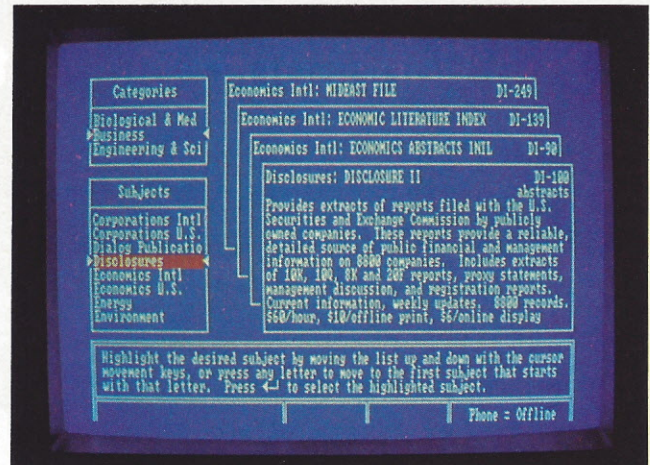
After booting DOS, inserting the In-Search systems disk and typing CONFIG, you'll reach a screen and have to identify your model computer, monitor and modem. (Protocols for Hayes and Novation modems are supported.) The program then asks for the local access numbers of up to three communications networks. You are then taken back to the A>prompt where you type INS to start.

You can wait to begin your search before connecting to Dialog. The data base selection and search request strategy are worked out off-line, saving money in connection costs.

Once you've typed INS and started the program, you can use your intuition to scan through the available data bases and search for information. What appears to be a stack of three by five library catalog cards takes up a major portion of the screen. Each card lists a Dialog data base in alphabetical order by subject heading with a short explanation of the references contained and the cost of using it.

You are offered choices from four category disks supplied with the program: arts, education and social science; biology and medicine; business, government and news; engineering, mathematics and physical science. After inserting the appropriate disk, use the cursor keys to select a data base from the list on the left side of the screen.

Once a data base is selected, you have to enter a search request. The file cards seen previously on the screen have been replaced by a large window. Enter the words you want Dialog to search for, as many as you want, and



To choose the appropriate data base, you "flip" through a stack of on-screen 3" by 5" "library cards".

Dialog will search the data base and count the number of references to match your request. Single words can be searched for as well as references that contain the "intersection" of two or more words or phrases. The words "or" and "not" can also be used to refine the search.

For example, you think coffee may be keeping you up nights. On separate lines labeled S1, S2 and up, you could type "caffeine," "sleep," "caffeine or coffee," "insomnia," "sleeplessness" and various combinations of those lines, such as S1 and S2 or S4 and S6. Next you press the Command key, F9, Return and In-Search will log onto Dialog, select the correct data base and begin searching. In seconds, the program will provide a tally of the number of references found.

The words you ask Dialog to search for are crucial to the success of your research. Specificity provides references closer to the subject. If you want to find articles which explain how rabies treatment affects young children, you'd have more luck with words like "rabies" and "toddlers" than with general words such as "dogs" and "children."

The program's "indexes" help narrow the search further. A search can be conducted by author, publication date, journal name, descriptors (key words that express the main subject of an article) and other indices. It's important to choose your words (and the format in which you enter them) carefully. Each data base has its own idiosyncratic way of storing information. When you're doing a search and using the author index, one data base may give you 15 references for articles written by Smith, Bob, but no references for Smith, B. It may be reversed in another data base. In-Search can help you with a sample of the proper format by pressing I (index) and then X (expand), but this must be done in each data base.

Once a data base is selected and Dialog has searched for



references that match the criteria, it's time to retrieve that information.

By pressing the Command key, F9, then highlighting RETRIEVE on the bottom of the screen, you can choose the references you want to see and whether you'd like to view the short, medium or long versions. Press Return and you'll see the references Dialog has unearthed on-screen in seconds.

Although Dialog may locate an article that contains exactly the information you need, all you may be able to download is biographical information about the article and a brief synopsis.

Dialog accepts orders for hard copies of the original document and In-Search makes placing that order a matter of hitting a few keys. But the price could be high. We requested an article from a well-known business magazine which cost \$14.

In-Search does have another attractive feature. While the program is in use, you can request an estimate of the Dialog charges. In-Search will provide the information.

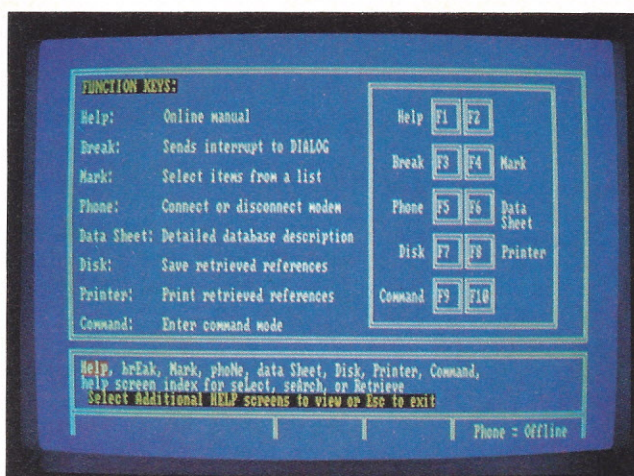
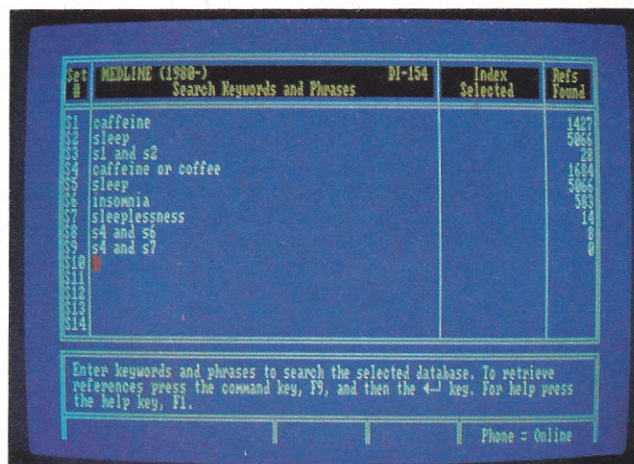
In-Search was developed with careful attention to detail. It's simple to use, there's plenty of on-screen help and the program comes with a tutorial disk that makes the learning process easy.

There's enough on-screen help with In-Search to make referring to the documentation a thing of the past. A command box is a permanent feature at the bottom of the screen and it explains what will happen if certain keys are pressed. For example, at this point it says, "Highlight the desired subject by moving the list up and down with the cursor movement keys . . . Press (the enter key) to select the highlighted subject."

Pressing the F1 key provides help no matter what screen you're on. The help screens vary, depending on where you are in the program, but always describe the screen or a selected command. They also list other help screens that pertain to related topics. If you're confused about the commands that are at your disposal, pressing F9 will give you a list of every command you can access at any point. The program also includes a plastic template that fits over the function keys. It's there to help if you forget what the various function keys do.

The program provides amenities that allow you to save successful search strategies, reload and use them later. You can mark selected references to be printed and eliminate others you don't want to save. Several related words can be searched for at the same time by using a "wild-card" character. Listing manag?, for example, would provide records containing the words manage, manager, managers, managing and management.

Since it performs many data base operations off-line, In-Search can help you keep connect charges low, a point emphasized by Menlo Corporation for current Dialog users.

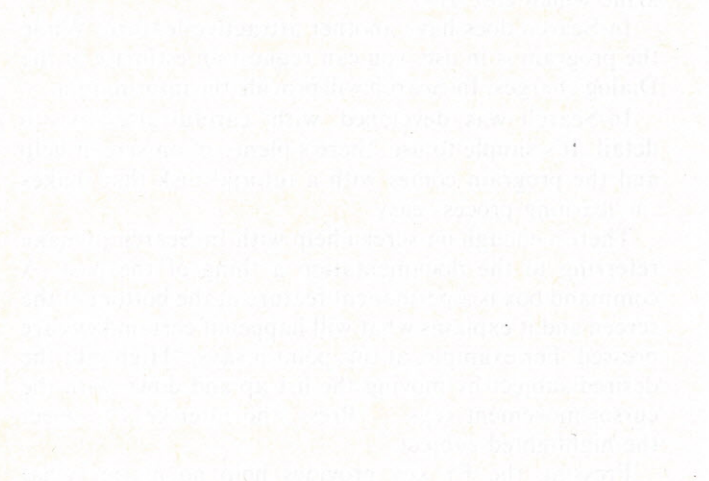
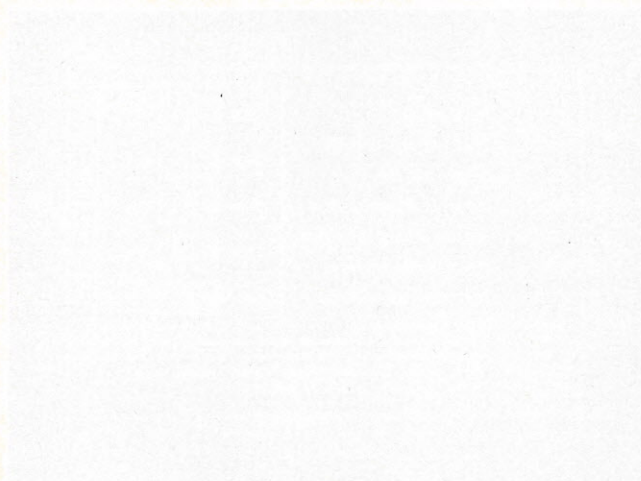
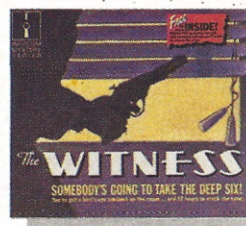
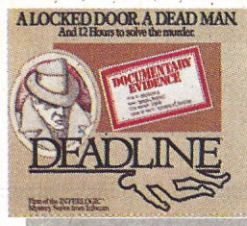


Selecting the F9 function key (displayed in the help menu on the bottom) will automatically log you on to Dialog and begin your search through the data base.

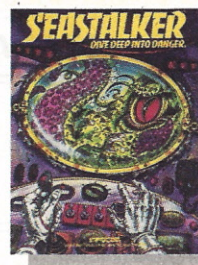
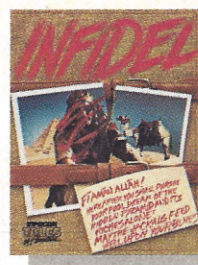
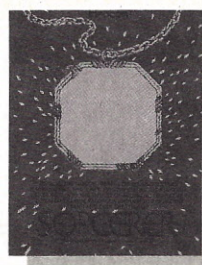
In-Search is a great program if you need all the capabilities it provides, but it's not for everybody. It is a fairly expensive program (\$399) that accesses a wide variety of publications, including some very specialized journals. If your research needs aren't extensive, if your local library has adequate resources and if finding information fast isn't crucial, then you may not need the features In-Search offers. But if the capability to access thousands of articles at any time excites you; if you currently use Dialog or you would like to but have been discouraged by the service's complexity; if research monopolizes your time; or if you live in an area where well-stocked libraries are scarce, In-Search may be for you.

In-Search runs on the IBM Personal Computer, the Texas Instruments Professional and IBM compatibles. **FOR MORE INFORMATION:** MENLO CORPORATION, 4633 Old Ironsides, Suite 400, Santa Clara, CA 95050; (408) 986-0200.









# THE INCOMPLETE WORKS OF INFOCOM, INC.

Incomplete, yes. But it's not just because we're always bringing out new stories in the Infocom interactive fiction collection. Nor is it simply due to the fact that with all the writing and re-writing, honing and perfecting that we put into every one of our stories, our work is seemingly never done.

The real reason is: an Infocom work of fiction can never be complete until you become a part of it.

You see, as hard as we work at perfecting our stories, we always leave out one essential element—the main character. And that's where you enter in.

Once you've got Infocom's interactive fiction in your computer, you experience something akin to waking up inside a novel. You find yourself at the center of an exciting plot that continually challenges you with surprising twists, unique characters (many of whom possess extraordinarily developed personalities), and original, logical, often hilarious puzzles. Communication is carried on in the same way as it is in a novel—in prose. And interaction is easy—you type in full English sentences.

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\*Use the IBM PC version for your Compaq, and the MS-DOS 2.0 version for your Wang or Mindset.

CIRCLE 23



### A "COMPLETE" SYSTEM FOR INVESTMENT MANAGEMENT

by David Gabel, Senior Editor

**W**inning in the investment market requires a number of disciplines. You have to gather intelligence about the market you're in. You have to be able to make investment decisions based on that intelligence. Finally, you have to know what your investment positions are to know how future market moves will affect you and, coincidentally, to make a good accounting of all your activities to the Internal Revenue Service.

Winning on Wall Street, The Complete System, helps you with a lot of those disciplines. Comprising three modules—the Trader's Data Manager, the Trader's Forecaster and the Trader's Accountant—this program lets you build and maintain a data base of securities of interest, perform technical analysis on that data base and keep track of your own investment portfolio.

Unlike the Market Microscope from Dow Jones Software, this package will not do fundamental analysis of companies in the stock market.

Let's define some terms: There are two kinds of analysis that traders perform on companies traded on the stock market—fundamental and technical. The former is analysis about the underlying strength of a company. Its parameters are things like the dividend the company is paying on common stock, the estimated growth in earnings-per-share of common stock, the company's earnings, sales and profits. Technical analysis views the performance of a security in the market and attempts to predict future movements in the price of a stock on the basis of the security's past performance. Its parameters are the high, low, close and volume of a security. Put simply, fundamental analysis can tell you which company or companies of a particular group are better buys and technical analysis attempts to predict when you should buy or sell.

You need a combination of fundamental analysis and technical analysis to make sound investment decisions, according to Alan Fuerstein, a consultant for Dow Jones Software. Winning on Wall Street can help you do the technical analysis.

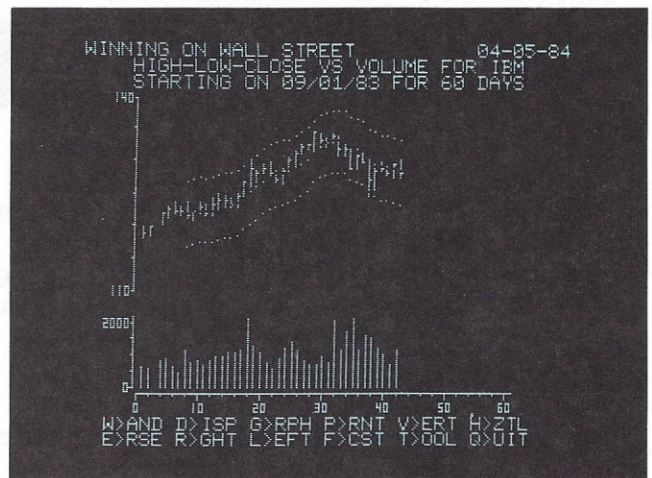
#### What does it do?

That said, I have to point out that this is a superb program. It can produce a wide variety of charts and graphs that allow you to perform the technical analysis required for correctly timing buys and sells. The Trader's Forecaster will compute points at which a stock price is to go above or below price trend lines. These computed points may be the time to buy (a low) or sell (a high).

The data required for all these charts and calculations is available from the Dow Jones data base through the

Trader's Data Manager. This module will give you the means to log onto the data base automatically and download the information you want.

The information download portion of this program has a nice feature. With similar programs I've tried, you configure the disk to ask for the information you want and then the information comes to you all in one gulp. The advantage is that you get lower connect-time charges since you don't waste time connected to the data base keying in information requests. The disadvantage is that you get similar information on every security on the disk. There's no capability to ask for different information.



Winning On Wall St. can produce a wide variety of charts from the information it downloads from the Dow Jones data base.

With this program, you can either update the whole disk or query for individual securities. Your only flexibility in the data download, however, is on the time span of the information you want—unless you've already told the program to ask for different information for different securities when you build your stock files.

Whenever you use the program, you begin with the module selection screen. From there you can choose either the Trader's Data Manager or the Trader's Forecaster. (The Trader's Accountant is on another disk.) If you pick Trader's Data Manager, you get another menu that allows you to create and/or modify stock files, enter data manually to those files or download data from the Dow Jones data base.

Before you enter data you have to create the stock file. Selecting the option to do that, you are prompted through the file-creation process. I created three files—IBM, DEC (Digital Equipment Corporation) and TXN (Texas Instruments). Creating a file is simple. You enter the stock symbol, DEC, and the stock name, Digital Equipment Corporation. Then you're presented with an

(continued on page 63)



**Dow Jones  
means  
business.<sup>SM</sup>**



# The leading name in business information is now the leading name in business software.

The Wall Street Journal. Barron's. Dow Jones News/Retrieval.<sup>®</sup> Dow Jones has set the standard for business information for over 100 years. Now Dow Jones introduces a full range of business and financial software for personal computers. Many of these programs manage information from Dow Jones News/Retrieval, the nation's leading online news and information service. All programs entitle you to a News/Retrieval password.\* All set standards for business and financial software.

\*Telephone and modem required for News/Retrieval.

## Accounting

New from Dow Jones, the accounting series is designed to meet all the accounting needs of small businesses. It offers power and flexibility, yet is easy to learn and use. When you purchase Dow Jones General Ledger, Accounts Receivable or Accounts Payable, you are eligible for a free training seminar designed by Arthur Young, one of the nation's foremost accounting firms.\* This seminar covers computerized accounting and bookkeeping principles.

**Dow Jones General Ledger<sup>™</sup>** is the heart of the accounting series. Using *Generally Accepted Accounting Principles*, the General Ledger allows you to define the structure of your chart of accounts and establish account ranges for assets, liabilities, capital, income and expenses. It offers double-entry bookkeeping that's

never out of balance, and allows you to post entries "in pencil" for easy error checking and correction. When you are satisfied, you can close your books and the General Ledger posts your entries "in ink" and freezes a full audit trail. When you print financial reports, the General Ledger formats them to reflect the structure of your chart of accounts.

**Dow Jones Accounts Receivable<sup>™</sup>** and **Dow Jones Accounts Payable<sup>™</sup>** complete the basic accounting system. Programs for Sales Order Entry, Purchase Order Entry, Manage-

ment Analysis and Inventory will be available early in 1985.

By Trademark Software, Inc. and Dow Jones & Company, Inc.  
Available for the IBM<sup>®</sup> XT.

\*Seminars and product may not be available in all areas.

The screenshot displays a 'Sales Journal' window. At the top, it shows 'JOURNAL ENTRY' and 'FEB-22-84'. Below this, there are fields for 'Journal ID', 'Offset Account', 'Transaction #', 'Customer', 'Sales Order #', 'Invoice #', and 'Date'. The main part of the screen is a table with columns: 'Seq', 'Account', 'Description', 'Debit', and 'Credit'. The table contains several entries, including 'Sales - Computers', 'Sales - Printers', 'Sales - Misc.', and 'Sales - Jones Payable'. At the bottom, there is a 'Totals' row showing a balance of 7,012.38. Below the table, there is a prompt 'Enter Invoice #'.

Seq	Account	Description	Debit	Credit
1	410	Sales - Computers		4,593.00
2	411	Sales - Printers		750.00
3	412	Sales - Misc.		1,150.00
4	413	Sales - Jones Payable		75.32
5	112.1	Trade	7,012.38	
6	Totals		7,012.38	7,012.38

Journal Entry, Dow Jones General Ledger

## Investment

Dow Jones investment software was introduced in 1982 and rapidly became the leader in the field. These best-selling programs, expressly designed for investors, money managers and business planners, allow you to analyze and manage your investments using financial information from Dow Jones News/Retrieval. You also have easy access to business news and headlines, economic updates and forecasts.

**Dow Jones Market Analyzer<sup>™</sup>** is an integrated technical analysis and communications program that can increase the effectiveness of your

investment decisions. The Market Analyzer collects and stores historical quotes from Dow Jones News/Retrieval, and automatically updates daily data on stocks, bonds, mutual funds and options. It then calculates and constructs price and volume charts, trend lines, moving averages, support/resistance lines and many other charts.

By RTR Software, Inc. and Dow Jones & Company, Inc.  
Available for the IBM<sup>®</sup> PC, IBM XT, TI Professional and Apple<sup>®</sup> II computers.

**Dow Jones Market Manager<sup>™</sup>** provides you with a powerful investment information system for maintaining single or multiple portfolios.



(continued from page 56)

attributes screen. You enter the attributes you want to track for that stock: the high for the day, the low for the day, close, volume, etc. You can also define derived attributes such as CLS/VL, the ratio of the stock closing price to the volume for the day.

You define all the attributes you need, along with translation codes which are explained in the documentation and with storage codes. Stock prices have a storage code of S, for example, which stands for stock price. After you enter the last attribute for a particular issue, you hit RETURN twice to move on to another stock. In the stock files created for this demonstration, I defined only High, Low, Close and Volume, since I knew that would be all the information I could use with my somewhat limited knowledge of the stock market.

After I'd defined the attributes, I went back to the module selection menu and configured the system. In the configuration module, I told the program what type of Apple computer I have, where the printer is, the number of drives, and, most important, the phone number to connect to Dow Jones and my Dow password. Winning on Wall Street uses this information to auto-dial and log on to the data base.

### **Information on demand**

To get to the auto-download portion of the program, all you have to do is select that option from the Data Manager's menu. The program loads its communications module and begins the dialing and log-on. When that chore is completed, the program prompts you for the stock symbol for which you want information. You can also enter A to download information for the whole disk.

I wanted all the files updated, so I entered A. The program asked for the time period I wanted. I responded with the range of dates to the first of the year. Next, the program downloaded the data I had asked for. After each page of information had been loaded, the program wrote each attribute list to disk, informing me of its progress. Then it went to the next page of data. Five minutes elapsed from the time a download started until the file writing was completed. This communication was at 300 baud, but the program is also capable of 1200 baud communications.

When the download was finished, the program asked for a new stock code. Or, it informed me, I could enter SHIFT-N (an up arrow) to end the communications session, which I did. The program hung up the phone and returned me to the Data Manager menu.

I now selected the graphics option from the menu, which led me to another menu asking about date ranges. Did I want plot from a starting date, or to an ending date, or did I want a range? I asked for a range of dates and was prompted to enter the range. Then I got a choice of graph

type—H-L-C-Volume, or other attributes. Since I only had stock prices and volume, I selected that type of graph.

The program asked for the stock symbol. I entered IBM. Then it started searching for the data on IBM and again told me what it was doing. Finally, it said it was building the graph. The graph appeared in a few minutes. It was the standard graph you see in newspaper financial pages, a bar indicating the range of prices for the day, a tick mark for the close. Volume appeared as a standard bar graph under the stock graph.

### **The Forecaster**


You can do more graphics in the Trader's Forecaster, which is on the same disk as the Trader's Data Manager. To get there, I pressed Q to leave graphics, then just worked my way back through the menus until I got to the module selection screen and asked for the Trader's Forecaster. (It can be bought separately and the documentation tells you how to install it on the Data Manager Disk.)

When I selected the Forecaster, I was presented with the menu again. The whole point of this module is performing technical analysis, so the menu is oriented to the graphs necessary for that analysis. There are the choices for date ranges, similar to those I encountered in the Data Manager, and there are also choices for point and figure charting and a matrix projection formula.

Constructing graphs in the forecaster proceeds as it does in the data manager, but there are other things you can do with the graphs. In this module, for example, you can get a least-squares fit of the data, or construct moving averages with trading bands, or perform adaptive filtering, or construct speed resistance lines. The only option I selected was the moving average, because my knowledge of technical analysis gets shaky beyond that. But building the moving average is simple. You ask for it after the graph is constructed. The program asks for the number of days in the moving average and that's all there is to it. Your moving average is drawn on the graph.

I haven't talked about the Trader's Accountant. It's simply a specialized data base manager that keeps track of your portfolio. The documentation for this program module has a tutorial that takes you through the program step by step. There should be no problem using it. I didn't talk about it because, quite frankly, the other two modules are a lot more fun to play with. But some sort of portfolio accounting package is a necessity if you're serious about your investment positions and this one does the job as well as any I've seen.

Winning on Wall Street runs on the Apple II and IBM personal computers. The Complete System sells for \$700. The Data Manager costs \$200, the Forecaster costs \$250 and the Accountant costs \$350.

**FOR MORE INFORMATION:** SUMMA SOFTWARE, P.O. Box 2046, Beaverton, OR 97075; (503) 644-3212. 



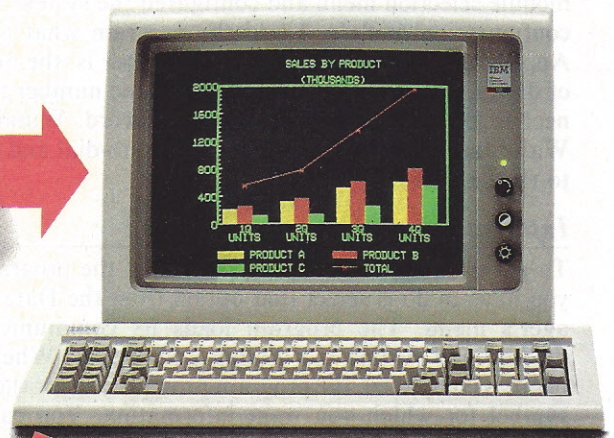
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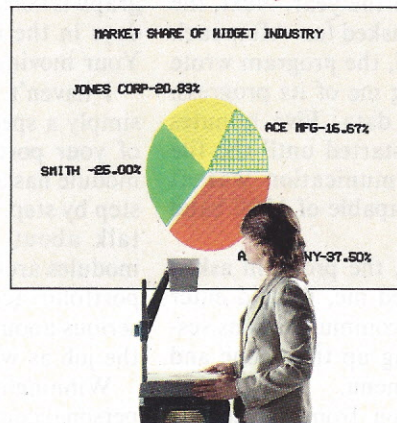
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## The Latest News And Views

■ **AT&T's Computers** ■ **Learning Russian** ■ **Eyeing Medical Advances** ■ **Trading Real Estate** ■ **Big League Computing** ■ **In The News**

### AT&T Enters Computer Marketplace

As the media and the computer industry looked on, AT&T assumed its expected role as a participant in the commercial computer marketplace with the introduction of a new line of Unix-based machines.

The announcement, made at the AT&T headquarters in New York and teleconferenced to press groups in Chicago, San Francisco and Washington, D.C., focused on the new 3B family of 32-bit processors that includes a multi-user microcomputer and five superminicomputers. Two computer networking products were also introduced by AT&T at the press conference.

AT&T's entry into the general purpose computer market was officially announced by James E. Olson, vice-chairman of the board of AT&T, who called the introduction "the broadest initial product line in the history of the industry." Olson, who is also chairman and chief executive officer of AT&T Technologies, Inc., indicated that more computer products from AT&T would follow.

While AT&T did not introduce a personal computer, several of the eight new products unveiled by the company are of particular interest to the personal computer user. The multi-user supermicrocomputer,

dubbed the 3B2/300, may offer a few hints as to what the expected AT&T personal computer will look like. Part of the "low end" 3B2 line of AT&T computers, the 3B2/300 is a desktop, 32-bit supermicro running on Unix System V that is capable of handling up to 18 terminals. But the 3B2/300 can also be configured as a single-user system.

As a personal workstation, the 3B2/300 can be used for sophisticated engineering and office applica-

tions, according to Jack M. Scanlon, president of AT&T's computer systems division. Graphics, multi-windowing, mouse control and compatibility with the rest of the 3B family are among the features which, said Scanlon, place the 3B2/300 "well out in front of other multi-user desktops." The 3B2/300 is priced at \$9950.

Scanlon also detailed two new local area networking (LAN) products, 3BNET and PC Interface. The PC



Jack M. Scanlon, president of AT&T's Computer Systems division, describes the company's new computer products at its New York press conference.



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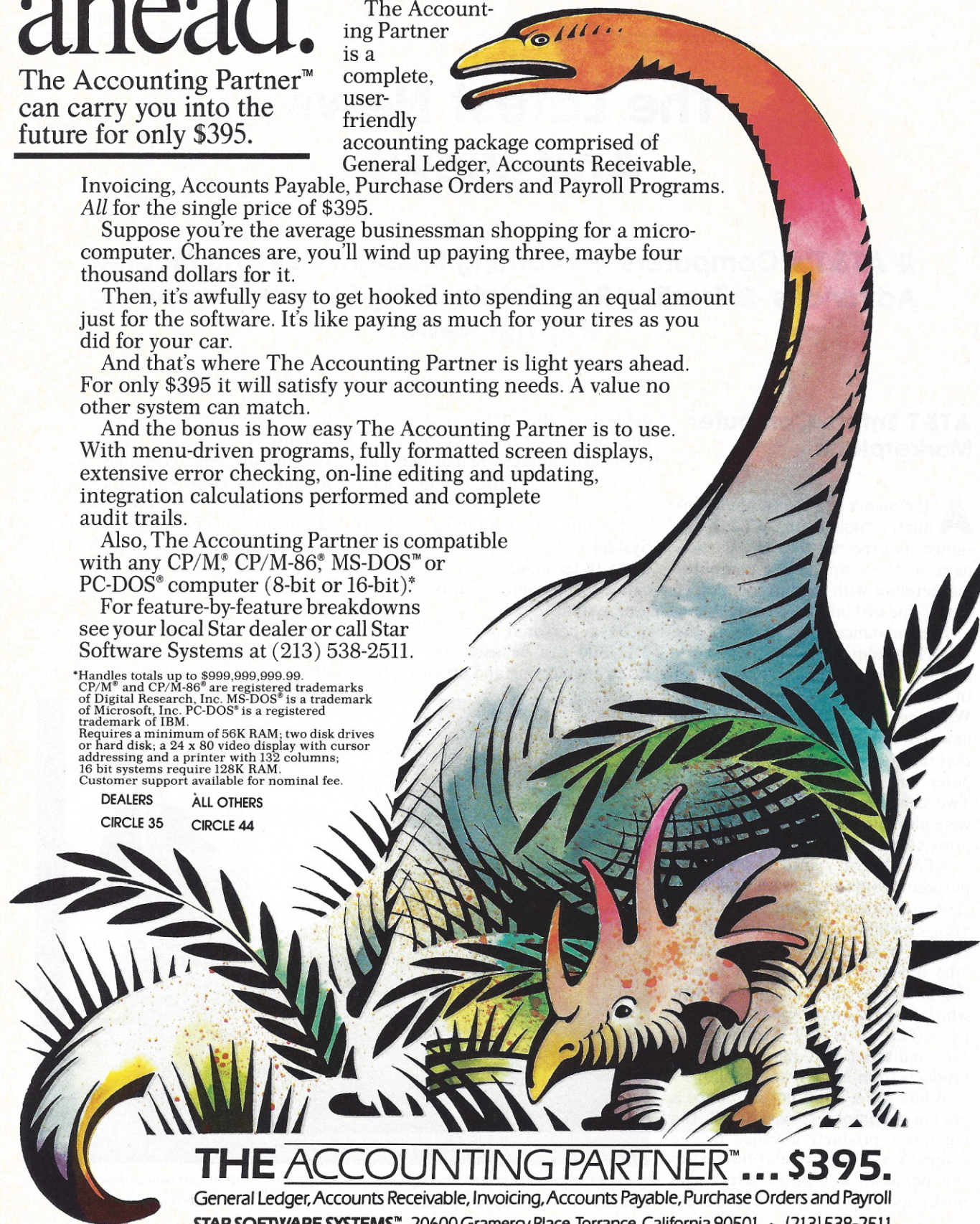
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Interface product, which will be available later this year, is of special interest to the personal computer marketplace because it allows the 3B2/300 to connect with personal computers running under the MS-DOS operating system. A combination of hardware and software, the PC Interface forms a network of personal computers—linked to the Unix-based 3B2/300—that permits the sharing of information and computer peripherals.

Both Scanlon and Robert J. Casale, president of marketing and sales for AT&T Information Systems, brushed aside questions concerning a future announcement of an AT&T personal computer.

AT&T chose the minicomputer and supermicrocomputer market segment as its point of entry, according to Olson, because it is a rapidly growing part of the computer market with the trend being toward multi-user systems. Olson said the multi-user and networking products also comprise an area of computer technology with which AT&T is already familiar.

Until this year, AT&T was restricted by federal regulations from selling computer products of any kind to the general public. The company's recent breakup, however, cleared the way for AT&T to enter the commercial computer market. AT&T expects to sell these initial offerings to original equipment manufacturers (OEMs), value-added resellers (VARs) and large corporate clients. Marketing computer products directly to the consumer is not likely to begin until AT&T introduces its personal computer, an event which industry analysts expect to occur sometime later this year.

Olson stressed that while AT&T is new in the commercial computer market, the company is no stranger to the development and use of computer technology. "I think it's important to remember that AT&T is no Johnny-come-lately to the computer busi-

ness," said Olson. "We've been in the computer business for years. Indeed, we helped create the computer business. In reality, then, what we are announcing . . . is a natural extension of a business we've been in for years."

The company is betting largely on the Unix operating system, the latest version being Unix System V, to help AT&T carve out a niche in the crowded computer market. AT&T has been hurrying to develop more applications software for Unix—an operating system known for its multi-tasking, multi-user capabilities—in order to position it as an industry standard.

"By concentrating on products geared to the Unix operating system, we're aiming at what is in essence an entirely new segment of the information market," explained Olson. "It is a market that didn't even exist four years ago, one that industry analysts estimate will generate revenues of \$7 billion by 1986."

In addition to the Unix operating system featured in the company's new line of computer products, Olson pointed to an "intangible strength" that he believes AT&T brings to the computer marketplace: "staying power."

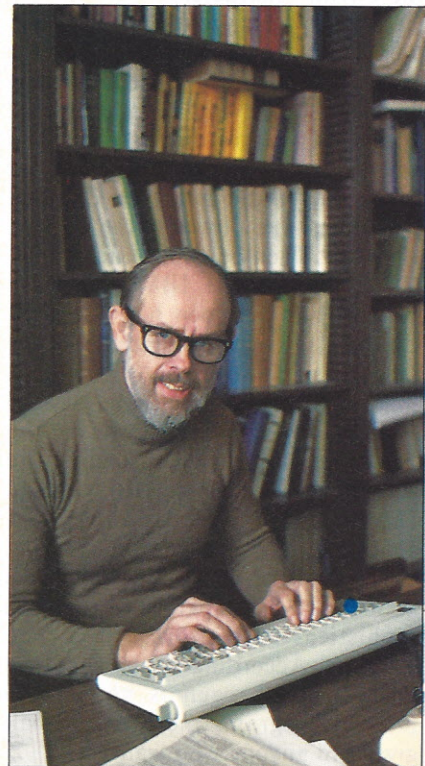
"Our entry into the computer market is not a tentative or speculative venture," Olson noted. "The scope of our first offering signals our intention—indeed, our commitment—to be a major and reliable supplier of advanced computer products. In short, we're in this business in a big way, and we're in this business to stay."

But AT&T's initial computer entries, some analysts claim, will not really test its often-questioned marketing ability, largely because the company is still playing the computer game on its own turf—supplying familiar technology to high-volume customers such as OEMs and VARs. AT&T's first large-scale marketing efforts may begin with the expected introduction of its personal computer.

## Computer-Assisted Russian

Computer-assisted instruction is gaining ground in learning institutions these days, thanks to new applications software. A good example of this trend involves a program which takes advantage of the capabilities of an IBM Personal Computer to teach Russian to Stanford University students.

Professor Joseph Van Campen of Stanford's Slavic languages and



Photograph by James Mason/Black Star

**Professor Joseph Van Campen has developed two personal computer programs to teach Russian to university students.**

literatures department has authored two programs for use on the IBM machine. In order to use the letters of the Cyrillic (Russian) alphabet in his programs, Van Campen first used a character generation program called Chargin, which was developed by Randal Melen, a project manager in



the Center for Information Technology at Stanford. Van Campen wanted to use Cyrillic because "the students don't want to work on Russian in Latin transcription."

There are two 128-character sets in the IBM Personal Computer. One contains the letters of the Roman alphabet and symbols we use every day; the second stores commonly used Greek, French, and Spanish letters, as well as a variety of mathematical and scientific symbols. Using Chargin, Van Campen was able to replace the second character set with the Cyrillic characters.

The Chargin program, developed by Melen using BASIC and the graphics capabilities of the IBM, produces a screen with a rectangular grid of 64 squares. Pressing the plus key fills a square with a large dot. By filling dots in the grid, Van Campen is able to shape a letter of the Cyrillic alphabet. Then he enters each of the 30 letters into the IBM's software system. Van Campen has also used Chargin to shape a character set for the Armenian alphabet.

The Chargin program—basic though it was—filled a void in the software market by allowing the generation of genuine Cyrillic letters. "Last March (1983), there was nothing on the market (for) creating characters like these. Now there are at least two companies with more sophisticated software," says Van Campen. According to the Stanford professor, Chargin is not a proprietary program, and Stanford will give it to anyone who wants it.

Second-year Russian students who go to the SMILE (Stanford Microcomputer Instruction Lab Experiment) center, see IBM Personal Computer keyboards with Cyrillic alphabet letters printed on paper tabs on the front faces of the keys. The usual Roman letters remain on top of the keys. Van Campen's two Russian language teaching programs, VOCDRL and FORMDRL, require that students type in answers using

the letters of the Cyrillic alphabet.

VOC DRL, a shortened form of vocabulary drill, "operates on the basis of vocabulary units," says Van Campen. "It allows the student who thinks he knows the vocabulary to check himself." The student picks one of the 25-word vocabulary units, and the program lists the words in English. The student types in the Russian equivalent of each word, and the program tracks his errors. When the student is finished entering the equivalents, his errors appear on screen, and he can print them out for further study.

FORMDRL, or form drill, tests students on verb forms, which are all stored on the disk. "If the student wants to do forms of a particular verb or noun," says Van Campen, "it (the program) simply reads that material off the disk into memory, and then drills him on those forms. It calls for English categories such as 'first person singular' and the student is supposed to type the Russian form. It (works) the same as VOC DRL in that it gives you a list of incorrect answers that you can print out and take home."

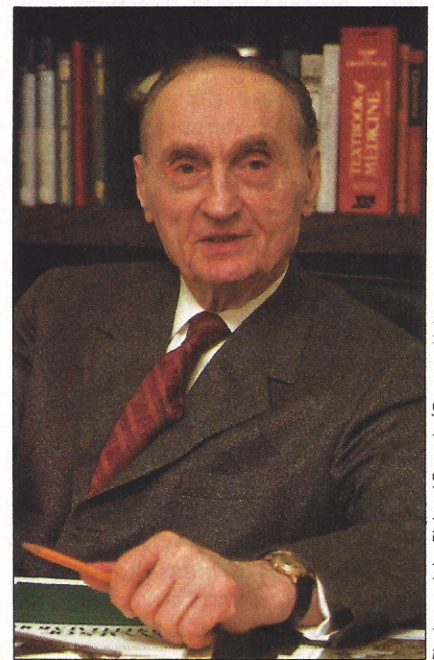
Van Campen is no newcomer to computer-aided instruction. His programming experience began in 1959 at Harvard, and Van Campen also did some programming for a computer-aided foreign language teaching project at Stanford in 1967. This project used teletypewriter terminals to teach Russian; the terminals, which could print in both Russian and English, were connected to a minicomputer.

Now, finding the personal computer well-suited for computer-aided instruction, Van Campen is developing more Russian teaching programs. He's working on a body of drills that will deal with syntax, and on a program that can devise simple problems for students to solve in Russian. "It would have the basic core of Russian grammar and lots of vocabulary," says Van Campen.

## Keeping An Eye On Medical Advances

**L**ike all doctors, ophthalmologists are in a race to keep up with new developments in medicine and their specific area of specialty. Now a new computer information network has been created that gives ophthalmologists up-to-date information on the drugs, treatment and equipment.

Dr. John G. Bellows, director of the American Society of Contemporary Ophthalmology in Chicago and founder of Eyenet, saw "a long-felt need by ophthalmologists as well



Photograph by Richard Faverly/Gamma Liaison

**Dr. John Bellows is editor-in-chief of Eyenet, a computer information network for ophthalmologists.**

as other physicians to obtain up-to-date information."

Dr. Bellows is the author of hundreds of articles and five books on this branch of medical science. "There was no adequate access to the latest information essential for providing quality eye care in daily practice," says Dr. Bellows. He reasoned that an information network for oph-

*(continued on page 72)*



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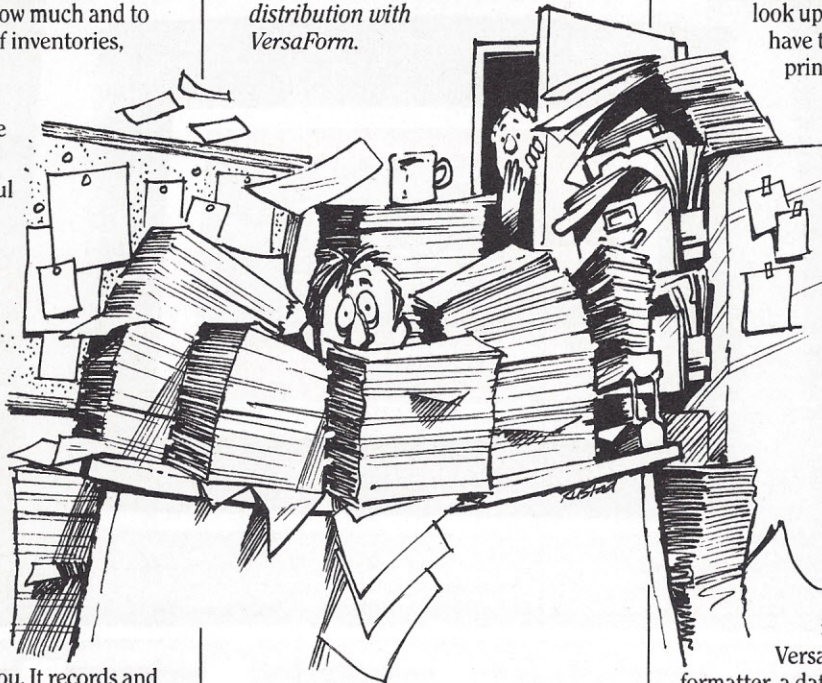
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- A roofing company in Green Bay, Wisconsin, computes job estimates, contracts, invoicing, and tracks actual costs with VersaForm.
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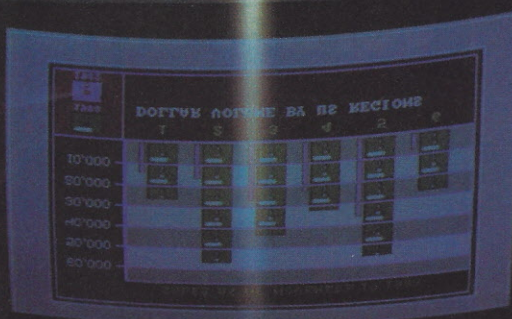
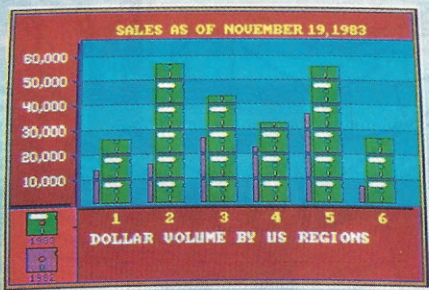
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(continued from page 68)

thalmologists "would fulfill a great need." The affordability and popularity of personal computers added to the feasibility of his idea.

"Physicians can no longer rely on months old journals or on books that may be years old," says Dr. Bellows. "Computer technology provides us with a quantum leap forward in providing information on all aspects of ophthalmology. I can't see how a doctor who's using a computer for billing and other office tasks wouldn't use his computer to get this valuable information."

Among the information provided by Eyenet is current data on various drugs, data that can help doctors change prescriptions or treatments, or advise the patient about possible health dangers.

Eyenet also obtains current information on clinical ophthalmology from Elsevier of Amsterdam, the world's largest medical publisher based in The Netherlands. This information is drawn from 3500 reference sources around the world and sent on magnetic tape to Eyenet's data base in Chicago. Tapes are received weekly and translated.

"Eyenet saves time," says Dr. Bellows. "The doctor doesn't have to search books or references if he can't recall the name of a new drug or treatment he remembered seeing somewhere. He can call on Eyenet and ask what the best drug is and the newest drug for a specific disease.

"It will be instantly available, rather than the doctor spending valuable time ploughing through journals, reference books and medical texts. Also, this material is more quickly indexed for retrieval than is now possible in medical library systems."

In addition, Eyenet's electronic mailbox allows doctors to consult with one another. Dr. Bellows hopes ophthalmologists will "get in the habit of reading electronic mail regularly, much as they would regular mail"

so they will be updated on the latest breakthroughs or warnings.

Eyenet can also help a doctor prove he is practicing current methods. "A Boston attorney recently warned our profession that if we don't have this kind of information we run the risk of negligence," Dr. Bellows says.

"Also, the computer can provide informed consent releases that will be tangible proof that the physician has told a patient all about the side effects of a proposed treatment and alternative therapies, along with unexpected reactions and unpredictable results. This printout can be signed by the patient and witnessed by the patient's spouse and the doctor's nurse."

The Eyenet service also features an "electronic journal" every month called the *Electronic Eye Journal* with articles, news bulletins and a calendar of meetings presented on the computer screen for subscribers of Eyenet.

Another service provided by Eyenet allows doctors to find out about and purchase applicable products. The service lists 57 categories of instruments, lenses and equipment used in ophthalmology ranging from surgical scissors to the most sophisticated type of equipment such as ultra-sound and lasers. There are over 3000 items listed with the manufacturer's name and the price of the product. Dr. Bellows says that the service saves a doctor from consulting various catalogs for this information.

The Eyenet network, scheduled to be operating this summer, will be offered through the General Electric Information Service which has offices throughout the United States and in most foreign countries. All a doctor needs is a personal computer, modem and some kind of telecommunications package. Subscribers dial a local phone number which gives them access, through G.E.'s telephone lines, to G.E.'s Eyenet data base in Ohio.

To subscribe to Eyenet, a doctor

has to be an ophthalmologist and must pay for time spent on the network, which, according to an Eyenet staff member, will cost about \$35 to \$40 an hour. The service itself, however, is free for the first year and Dr. Bellows hopes to keep it that way.

Dr. Bellows expects that more than 70 percent of the 13,500 ophthalmologists in the U.S. will be Eyenet users by the end of 1984. At least 3500 have signed up so far.

For information on the network, contact: Eyenet, 211 E. Chicago Ave., Suite 1044, Chicago, IL 60611; (800) 621-4002.

## **Trading Real Estate, Coast-to-Coast, Computer-to-Computer**

**R**eal estate professionals can share information and even make deals through their personal computers on the Exchange Network, a real estate marketing network created by Charles L. Huggins, a past president of the Society of Exchange Counselors and a member of the Real Estate Exchanger's Hall of Fame.

The Exchange Network, with offices in Palm Beach Garden, Fla., works through the General Electric Information Service's phone lines and data base. Through the network, members can buy, sell, exchange and transfer real estate. They can also arrange mortgages, set up escrow accounts and transfer title.

To use the Exchange Network, members pay \$4000 and connect their personal computers via modem to G.E.'s data base. Members pay for their time on the network. Yearly renewal costs \$250. Members must be working in real estate and be willing to share their own information because, in Huggins' view, "problem-solving requires that approach."

The Exchange Network has a Trader's Board and an exchange for listing properties, which, Huggins



says, are "as close to the stock exchange as you get in real estate." The Trader's Board lists properties pyramid style, with the first property put up receiving four offers and then those four offers each getting three more.

Huggins says the Trader's Board provides the opportunity for a "win-win situation" for traders instead of the traditional "one-upmanship" competition. "A moderator determines what will go up on the board," says Huggins. "So for a trader to get an item up on the board, he has to be reasonably fair and selective."

The Sandlian Running Exchange, which is named for the originator of the idea, Coby Sandlian, a Wichita, Kansas broker and member of the Society of Exchange Counselors, lists properties that will sell for cash. The lister puts up a description of what he is looking for and the moderator buys the property with the stipulation that the lister must use that cash to take another property.

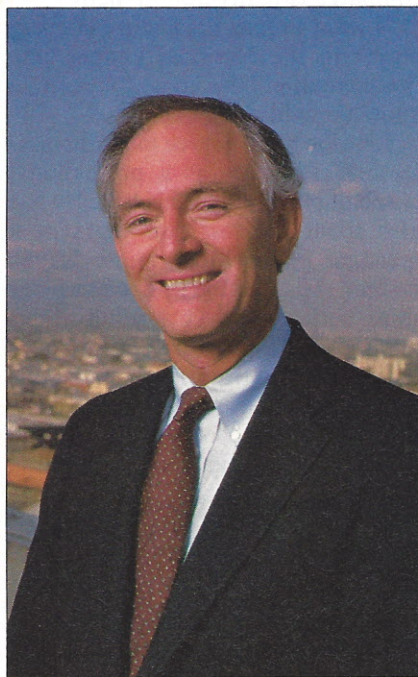
Huggins says the Running Exchange and the Trader's Board stimulate trading activity and uncover unknown properties, allowing people to work outside deals and creative arrangements such as three-way swaps.

Besides these services and the electronic mail that lets members contact each other to share ideas and information or to work out transactions, the Exchange Network gives users access to G.E.'s program library. This library has programs applicable to many fields, including real estate, and the Exchange Network lists appropriate programs in its menus.

Network users can apply simple and sophisticated tax and financial planning programs to their work. Programs include financial and lease analysis, financial planning, accounting, demographics and building cost estimation. With the demographics program, users can determine the marketability of various types of constructions in different locations

around the country for a given piece of land. The building cost program updates the cost of labor and materials anywhere in the country on a monthly basis.

The Exchange Network plans to develop its own specialized programs to go along with the programs available from the G.E. library. Other plans include hooking up with other real estate data bases to provide "an



**Charles Huggins created the Exchange Network to help real estate professionals share information by computer.**

umbrella system for all data bases related to the business," according to Huggins. "People will have at their fingertips information that would normally take days and weeks to obtain."

Huggins is a firm believer in networking—not only as it applies to computers, but as it applies to the sharing of information to solve problems.

"Problem-solving requires people who realize that custom isn't necessarily the best way to a solution." Huggins says that networking "forces

people to be more flexible, they need access to information and ideas." This access aids better performance. "The person who networks is not only more creative and flexible, but also more productive."

Huggins believes the networking approach has at least a partial built-in mechanism for ensuring the reputations of participants. While there is no guarantee that someone won't try to mislead a second party on the first deal, later deals would be difficult. "The problem-solver has to take responsibility for the knowledge of the party he's working with. People who are dependable and have integrity find that people gravitate to them to do business. Networking proves that honesty pays."

Another benefit of networking lies in what it can do for the small office that is located far from big information centers. "Networking will be a great leveler in the sense that it gives many people access to experts." Huggins says his Exchange Network is in touch with firms that have expertise in various fields.

The Society of Exchange Counselors, first customers and beta-testers of the Exchange Network, have been using a traditional network for the last 20 years. That network included about 100 members who shared information, ideas and resources through calls and meetings.

Since last September, members of the Society of Exchange Counselors have been using the electronic mail feature of the network, while the full slate of services went on-line to everyone in May.

Martin Reder, a broker in Santa Barbara, Calif., used the Exchange Network's electronic mail to complete a deal with parties located throughout the western half of the country.

"In San Francisco, at a marketing meeting of brokers, the possibility of a property exchange arose," says Reder. "We negotiated the contract in its entirety through electronic

Photograph by Alan Levenson/Gamma Liaison



mail, with me in Santa Barbara, my principal in Los Angeles, the exchanging client in San Francisco and his broker traveling between Boise, Idaho, and Billings, Montana. We were able to get the document in its final form approved by a San Francisco attorney for the fellow in Los Angeles to sign."

They negotiated the wording of the contract through electronic mail and produced a copy of the final draft on a printer. The use of electronic mail on the network reduced time spent on the telephone (Reder says only two phone calls were made) and eliminated the need to mail written copies back and forth until the document was agreed on by all parties.

For more information, contact: The Exchange Network, 4360 Northlake Blvd., Suite 208, Palm Beach Gardens, FL 33410; (305) 694-1280.

## Computing Hits The Big League

**G**etting a competitive edge on your opponent is the key to success in all sports and it's a big part of what a Major League Baseball manager tries to gain for his team. Some managers rely largely on their experience, others on their knowledge of the players and still others on "gut feeling."

Dave Johnson, a former major leaguer and the first-year manager of the New York Mets baseball team, often relies on his IBM Personal Computer in mapping out the best strategy for victory. Johnson, only a few months into his career as a major league manager, uses computer technology and the principles of mathematics to help figure out the probability of a variety of baseball outcomes—things like centerfielder Mookie Wilson stealing a base against a certain pitcher or 1983 Rookie of the Year Darryl Strawberry

hitting a home run with two outs and a runner on first base. And being aware of the probabilities, Johnson contends, allows him to help the team play better baseball.

"It's my job to make sure these guys are placed in the best role for the team," says Johnson, the 11th manager in the club's history. "I have to put them in situations where they're able to shine. And that's where the computer is really able to help.

"I want to feed the history of every player in the National League into the computer," he adds. "I want to know the odds."

Johnson has a degree in mathematics and 18 years as a professional baseball player under his belt. He has also spent the last two years as a manager in the Mets' minor league system. His teams won championships both years. As a result of his intense interest in applying modern techniques to a tradition-bound game such as baseball, you are as likely to hear terms like "optimization" and "standard deviation" from Johnson

as you are more familiar baseball slang. But high technology and baseball go quite well together.

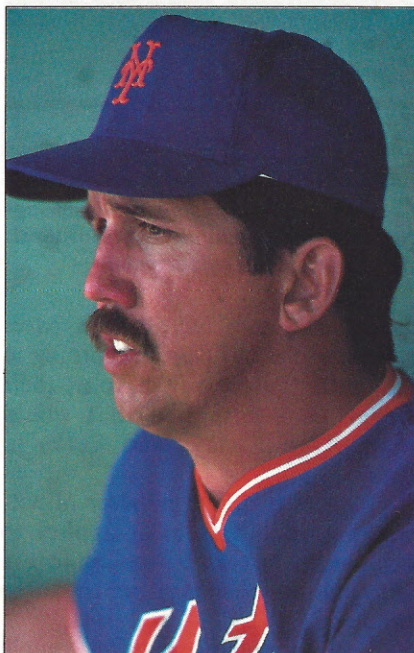
"It's kind of like having another coach," he says. "The computer enables me to use the optimum lineup, to be aware of the hitter versus pitcher success ratio and to try to make the right choices. I thought of this 17 years ago but couldn't get anybody to listen."

Seventeen years ago, as a second baseman with the Baltimore Orioles, Johnson was just beginning to tap the potential of a computer to help him achieve better results on the playing field. He even produced a computer-generated report called "Optimization of the Orioles Lineup." It was designed to show the best possible batting order for the eight regular players from over 300,000 variations. But most of his suggestions fell on the deaf ear of understandably skeptical Orioles manager Earl Weaver. Even his teammates occasionally took exception to his analytical mindset. "I used to tell (pitcher) Jim Palmer he was in an unfavorable chance deviation when he was (throwing) wild," Johnson chuckles. "He'd tell me to shut up and go back to second base."

So Johnson bided his time, continuing to study computer mathematics throughout a baseball career that included appearances in four All-Star Games, four World Series and a stint in Japan. The Mets tempted him away from his Orlando, Fla., real estate practice after he retired in 1980 and gave him the chance to manage.

His first order of business when named manager of the Mets was to design a special program to keep and display all the individual and team statistics he would require, a task he completed with the help of Lou Oddo, the coordinator of computer services at the University of Central Florida in Orlando. The program, running on the IBM Personal Computer that sits in his office adjacent to the locker room, is a data base system using the

*(continued on page 78)*



New York Mets manager Dave Johnson uses an IBM Personal Computer to compute an optimum lineup for his team.

Photograph by Ricardo Ferro/NYI Pictures



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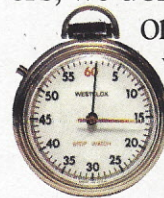


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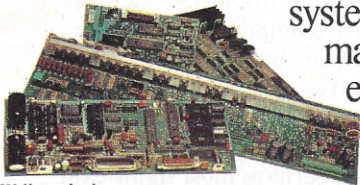
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CIRCLE 69



(continued from page 74)

popular dBASE II package. Johnson's personal computer is linked to a larger computer in the Mets' front office, which is linked with a computer in the office of book publisher and team owner Nelson Doubleday.

Before each series of games, Johnson calls up the pertinent statistics (which are updated daily) and makes any special changes or adjustments he thinks are necessary to give the Mets a better chance—at least mathematically—of defeating the opposition. But mountains of statistics won't mean anything, according to Johnson, unless you know what you're looking for.

"The key is knowing exactly what you want to get out of the program," says Johnson. "There are a lot of outfits that will give you a lot of data. I'm really using this program to cut through all the fat and get to the heart of the matter."

Through all his computer analysis and stacks of statistical printouts, Johnson never forgets that baseball is, after all, a human endeavor. And with human endeavors, especially in the crazy world of professional sports, come a number of factors which are just impossible to key in.

"There are a lot of things to consider," he acknowledges. "From a mathematical standpoint, you're dealing with formulas for probability. But there's also the human factor. The players are not machines and I can't expect them to perform like machines. So I have to keep one hand on the pulse of the players and the other hand on the machine."

Given Johnson's adeptness with computer analysis and probabilities, what are the Mets' chances for a pennant in the near future? "Well, I don't have all the data in..." the rookie manager says mockingly. He pauses for a moment... and then laughs quietly. "I guess it depends on whether I put garbage in there (the computer). But I think we can win it pretty soon."

## UPI Computes The News

**U**nited Press International is counting on the lure of personal computers to generate new business from small radio and television stations around the country. As a news service subscription incentive, UPI now offers a complete computerized broadcast station management package called the UPI Broadcast Computer System.

UPI's Broadcast Computer System is the first system of its kind to be offered by a wire service to radio and TV stations in the United States and Canada. It combines Zenith Z-150 personal computers with UPI proprietary software to handle business, program management and news functions.

Buyers of the system receive a subscription to the UPI news wire and the hardware. The software cannot be purchased, but will be leased to stations for "a small monthly fee," according to UPI.



UPI's William Adler believes the UPI Broadcast Computer System could "totally replace the news wire machine."

William Adler, vice president for information services at UPI, says UPI chose the Zenith Z-150 as the hardware component because "we wanted a company with a reputation for reliability and good service. Also, testing proved the computer to be tough and reliable in the field."

The system is "the first major change in our service relationship since 1935 when we first offered a news service," Adler says. UPI hopes the system will encourage non-subscriber stations to sign up with the UPI news wire.

Adler says UPI gathered feedback from broadcast stations around the country on what was needed before developing the system. Based on that research, UPI decided to break a broadcast station's needs down into three basic categories: Business, "traffic" and news. They then developed a software solution for each category.

For business needs, UPI's billing package produces bills for advertisers that will list advertisements and the times they ran. Stations can check the status of an advertiser's account at any time. This software also handles salespeople's reports as well as commission reports.

The "traffic" package, which automates the logging procedure required by the Federal Communications Commission for keeping tab of everything that goes on the air, is specifically aimed at broadcast stations. Adler says this software will also let stations prepare programming in advance and help sort out scheduling difficulties, such as making sure competing advertisers aren't on the air back-to-back. Adler says the software will condense the time spent in the logging and programming chores.

The third, perhaps most significant package, provides stations with a complete news storage and retrieval service that includes word processing capability. This package will allow stations to use the computer to sort




news stories coming in "over the wire" according to category or region. For example, local news can be separated from national and business news from sports.

Sorting of stories is possible because of UPI's coding of news items. Originally standardized for the newspaper industry 10 years ago, coding has been available for use in broadcasting for over a year, but Adler says stations have not taken advantage of it because they weren't using computers to receive news. By receiving this coded news by computer, users can sort news stories and even send stories to printers or other terminals.

The word processing package included as part of the news storage and retrieval is "a very modern package," according to Adler, with windowing capabilities that allow users to look at more than one item or story version on the screen at once. Users can develop as many windows on one screen as they want and can share data between windows.

For subscribers who already have a mainframe for business and "traffic" functions, UPI will sell the news retrieval and storage system as a replacement for the traditional news wire machine. "Two-way dial-up and sending is possible. People can send stories from portable computers in the field," Adler says.

The use of computers in the news industry began 10 years ago and "permanently changed it for the better," Adler says. UPI has been adding features to its news service based on the capabilities of the computer, but most broadcast stations haven't caught up yet.

"We've been operating at a higher technical level than our customers could take advantage of," says Adler. Adler believes the Broadcast Computer System can "totally replace" the news wire machine. "It's a better way to use the UPI news wire and it makes it easier for a station to generate its own stories using the word processing program." 



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# Which Computer Camps Are Best?

It depends on what you want for your child, experts say. In any case, there's a long, long trail between you and the perfect choice

by Arielle Emmett, Contributing Editor

**F**or the thousands of American youngsters who will be going off to camp this summer, the call of the wild includes a new imperative: computers. For their parents, it means another factor must be weighed in deciding what constitutes the perfect place from which a child can experience the first pangs of homesickness. For children, and therefore parents, who have opted in advance for a specialized "computer camp," the growing numbers and varieties of them—plus liberally stretched definitions of the term to include, for instance, storefront computer instruction—make this year's selection process even more bewildering.

The combination of a traditional outdoors experience with a hands-on computer encounter may still strike some of us as an unlikely, even forced, contrivance. But when it works, everybody—camper, parent and camping staff—is happy. Last year, for instance, when 13-year-old Eric Kroft of Ellicott City, Md., attended The Original Computer Camp (a trade name) in Colorado, his parents, Dr. Vernon and Lisa Kroft, paid for two weeks of semi-private dorm rooms, a four-to-one camper-to-staff ratio, use of the sports facilities, and courses in Logo, video graphics and FORTH, which Eric says he thoroughly enjoyed. The cost of the venture was "less than \$900," says Dr. Kroft, noting that the

price included a fee for floppy disks and notebooks, plus an optional rafting trip down the Colorado River. (The camp has since increased its prices.) The Krofts spent another \$227 in airfare so that Eric could go "far enough away from home so that it would be a vacation." The family agrees the experience was well worth the more than \$1100 they spent.

"I wanted Eric to realize that a computer is simply a machine to be used—not something to be afraid of," says Dr. Kroft. "Next year, though, I expect him to come back with some real programming knowledge."

Not every computer camper comes away satisfied, however; and plenty of parents have wished they had made better choices. There are more than 180 accredited camps—including day programs but not storefront classes—offering some component of computer instruction this year. Some of the specialty computer camps around the country now actually claim they can wed the pro forma outdoor experience with as much as 10 hours of concentrated computer instruction and practice each day. In addition to familiarization and computer literacy, common curriculum offerings also include robotics, artificial intelligence, the basics of BASIC and Logo and even more advanced languages. Some of the specialty camps do offer some outdoor recreation—swimming, hiking, boat-

ing, campfires and so forth. But in a number of these camps, an outdoor recreation period is not mandatory. In others, it's simply not available.

## *Making a choice*

How can parents select a good computer camp? Everyone agrees on the basics: The camp should be authentic—a place where youngsters can learn about computers and catch frogs in the same afternoon; it should be safe, well-staffed and (reasonably) clean; it should offer quality instruction that won't bore children or destroy their taste for learning. But there is more: Parents, for example, must weigh carefully how well a prospective computer camp balances its daily schedule and places restraint on "nerdy" or addictive behavior—i.e., that tendency to spend up to 12 hours a day in front of a computer screen burning one's eyes out over this or that programming wrinkle or, worse yet, games.

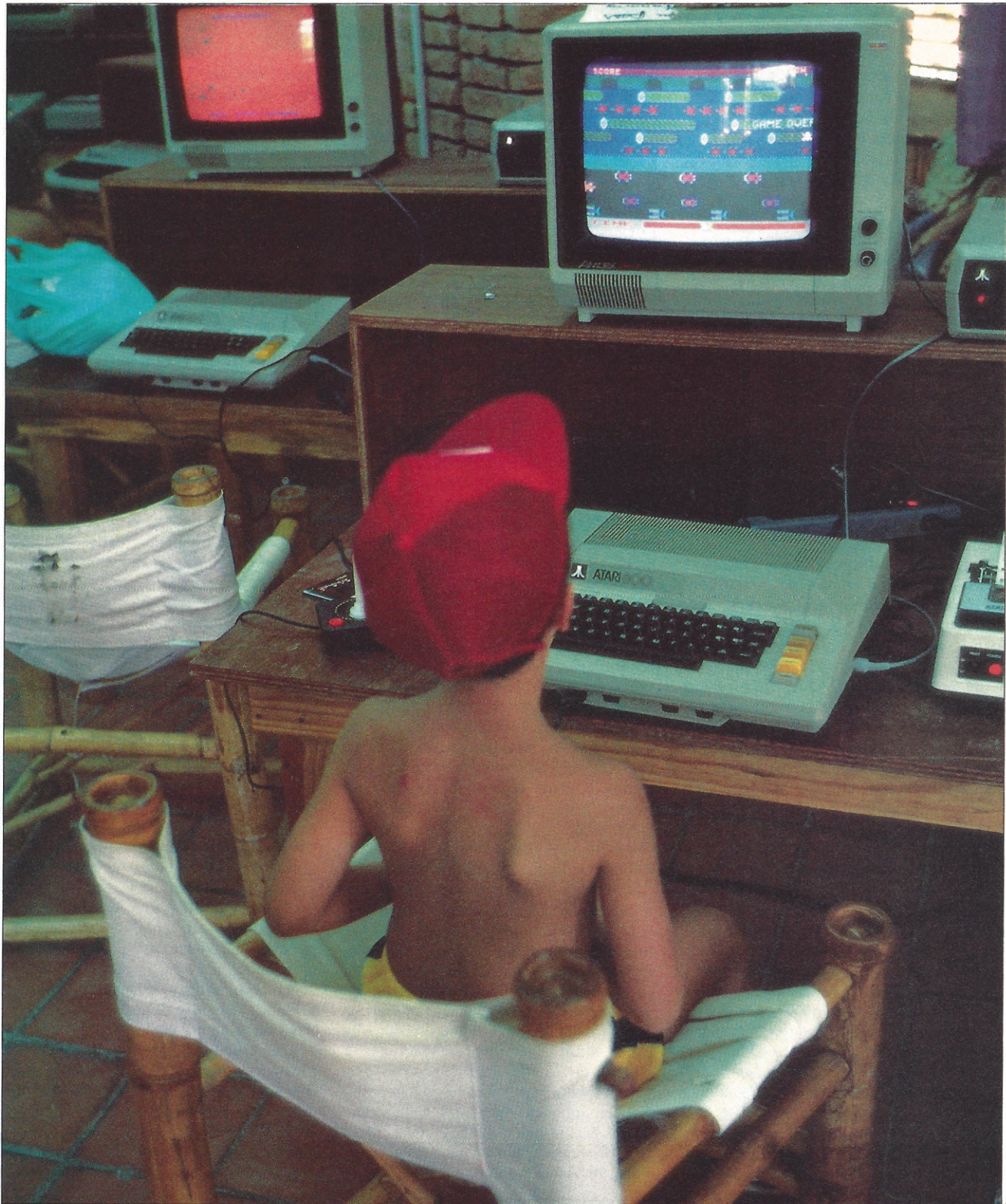
Not all of these features can be solidly guaranteed in advance, but by going directly to the camps' directors and asking the right questions, you can at least eliminate some of the various "Gulags" that have climbed on the computer camp bandwagon. What's the director's background?

---

**Computer camps integrate traditional camp activities with computer instruction and experience.**



*All camps vary in teaching style, quality  
and intensity of education, computer- and  
counselor-to-camper ratio and price.*



Photograph by Stephen Shames/Black Star



## WHAT ARE THEY LEARNING?

**W**hat, exactly, should kids be learning at computer camps? Experts differ on this subject. But one thing everyone agrees on is that kids ought to come away feeling they have mastered the computer, and not the other way around.

Instilling that sense of mastery, though, is the rub. Some experts argue that kids gain mastery when they are allowed to explore the computer with only some gentle prodding and guidance here and there. Others argue for a moderate to substantial amount of structure: lectures, in other words, followed by "labs." Another question educators bandy about now is whether beginners should learn Logo first, as opposed to BASIC. This either/or dilemma has now taken on the proportions of a feud. But whereas educators may be quite tired of hearing about it now, parents might do well to lend an ear.

The basic substance of the argument revolves around what type of thinking kids should be taught at an early age. Proponents of BASIC say that kids who start with BASIC can step into other programming languages. And many of the procedures in BASIC (like nested loops) can simulate the effects of Logo.

Proponents of Logo argue that BASIC teaches bad programming habits and concentrates too heavily on numeric thinking—strings, numbers, and variables—without helping kids see the computer as a symbolic device, e.g., a device capable of understanding instructions which designate a set of "primitives," or building blocks, creating more complex blocks and structures out of them.

Denison Bollay, director of The Original Computer Camp, Inc., says he favors Logo as a first language because, in his words, "music majors are just as important to me as mathematicians." What they respond to are symbolic languages like Logo, he argues. "Logo deals with symbols, not numbers like BASIC," says Bollay. With Logo, kids can begin to develop an understanding of relationships between symbols. They can learn concepts like "recursion," in

which a child can write a simple procedure for creating a square or spiral, for example, and the procedure begins repeating, or "calling itself" in the middle of its own execution, to create yet another spiral or square. Other concepts, like extensibility—the ability of the program to take simple building blocks and create more complex ones out of them—are also important, as are "random walk," problems—the ability to program a robot through a maze by thinking out all the possible steps. "To make it fun, we run a contest with robots," Bollays says. Whichever camper in the system gets the robot out of the maze fastest, wins the robot.

Barry Genzlinger, educational director of the Champlain College Computer Camp, doesn't believe that teaching one or another introductory language is the main issue—he teaches several at the camp. "What's important is that kids find a camp that offers the level they want to get into," Genzlinger says. "Teachers teach not only the specific language, but problem-solving, ethics, good structure (in the programming) and documentation." In the Champlain program, for example, kids learn to develop conceptual "flow charts" for their more advanced programs (in Pascal, for example); they learn how to use Remark lines (in BASIC) in order to understand the direction the programs are taking. "With beginners, (we stress that) thinking comes before programming," he says. "Once you've come up with the problem, you must come up with an algorithm that leads to the solution." Intermediates learn how to attack a problem by figuring out what the computing algorithm will be to solve it. "The main thing is to maintain the excitement," he concludes. "You don't enforce flow-charting in early programming, for fear of boring the child to tears. What you do try to do is maintain flexibility in teaching. I would certainly use Logo before BASIC with 6- or 7-year olds," he says, but for older children with some computer experience, "BASIC is a nice, friendly language, and it's available on every personal computer." With Logo,

there may be "difficulty of access" when the child gets home, Genzlinger declares.

To Jim Tartaglia, president of Compu Tar (Barre, Mass.), an educational computing company that creates package computer learning programs for traditional camps (including the YMCA-YWCA camps and Girl Scout Council of Greater New York, and eight camps for disadvantaged kids operating this year through the New York Urban Development Corporation), both BASIC and Logo work well for kids—along with a certain proportion of time devoted to teaching practical software applications. These include word processing (he uses Bank Street Writer), graphics (Graphics Magician), and problem solving (various Spinnaker titles). "We include (commercial) software for three main reasons," he says. "Most kids prefer to learn a little bit about many different areas of computing, rather than concentrating continually on, say, programming in BASIC. More 'real world' computer applications involve using prepared software." In addition, "the quality of educational software has improved dramatically during the last two years," he says.

That software has made it possible for campers to write letters home and to get the feel of writing text on computers, Tartaglia adds. However, programming with graphics still remains the key. At the Compu Tar program, "We devote most of our time to graphics programming as this is the application of greatest interest to kids. The programming and mathematical concepts used in graphics are just as complex as those used in text programming," he says.

At Sun Valley Computer Camp, graphics are also highly important—from creating pictures in Logo—mazes, a golf course, asteroids, circles and arcs—to perfecting abstract procedures like "To Square" and "To Rectangle." According to Dennis Dempsey and codirectors Brad and Terry Thode, campers also graduate from low- to high-resolution graphics in BASIC.



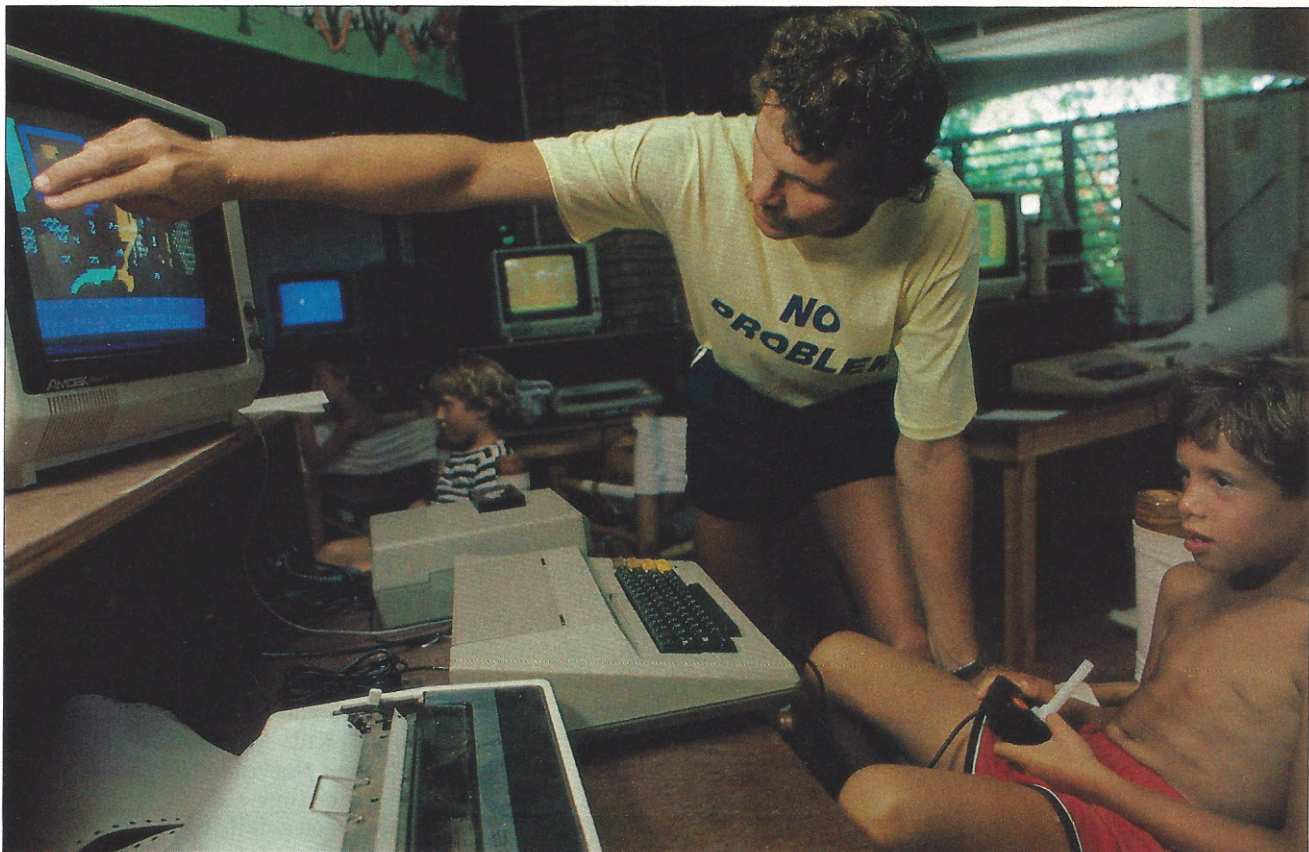
*"Fun is a very important aspect of camping. You want to have fun and learn. Fun frees the mind to learn more."*

What does the director look for in employing staff? What are the ages and backgrounds of the counselors? Has the camp made provisions for medical care? How many campers are there in your child's age group? Are there any costs not covered by the camping fee? Is the camp accredited? If not, why?

These and other important questions are among those suggested by the American Camping Association (see "How to Pick the Right Computer Camp," page 89), the major accrediting organization. Camps pay a fee to belong to it, and thus to be accredited, if they meet standards the industry sets for itself. Says ACA spokesman James LeMonn: "The camping business is one of the largest unregulated industries in the country."

Just as accreditation is not an iron-clad guarantee, lack of it does not mean a camp isn't a good one. Camps run by national organizations such as the Boy Scouts and YMCA often run programs which must meet high standards because they are supported by government funding; but they may not choose to commit funds to joining the accrediting body. In fact, very few specialized computer camps have been recognized and accredited by the ACA—less than 20 in the United States. They include the Atari Computer Camps, The Original Computer Camp, Inc., the Champlain College Computer Camp, the Midwest Computer Camp and others (see list on page 93). All of them claim to offer concentrated, quality computer instruction, combined with a full range of traditional camping activ-

ities. There are, however, a far greater number of institutions billed as computer camps. "We (the ACA) tend to be conservative on the subject," admits LeMonn. "Basically we feel that computer camps are a stop-gap measure until the schools provide regular computer instruction." The ACA's bias against specialty camps is an open one. "The instruction in computing at some (accredited) 'general' camps can be as intensive as four hours per day or more," LeMonn adds. But he also acknowledges that nonspecialty camps often tend to offer fairly free-form instruction that may not go much beyond basic skills and literacy. In its assessment of the health, safety and administrative standards for purposes of accreditation of a given camp, the ACA does *not* monitor the content or qual-



Photograph by Stephen Shames/Black Star

Many Club Med facilities, such as this one in the Dominican Republic, are now offering computer instruction.



*Kids sometimes have to be dragged away from their computers to take in an hour of fresh air and sunshine.*

### WHAT DOES IT COST?

**A**re computer camps overcharging for their services? Dr. Vernon Kroft, who looked into the rates of a number of camps on behalf of his son, 13-year-old Eric, says he found the \$900 price to be "mid-range." Some local programs were less expensive, but some camps, on college campuses, charged even more. "You have no way of knowing what you're getting into," Dr. Kroft says. "You just give it a couple of weeks. . . . You give it a try, and hope your assessments of the camp you choose are right, and that the benefits justify the costs." In Eric's case, fortunately (see text), they did.

Computer camp administrators say they charge more than ordinary camps because they provide more: expert instruction, a full range of facilities and classrooms, plus all that specialized equipment, including computers, software, modems, and so forth. According to Linda Gordon, an executive director of Atari Computer Camps, which includes two ACA accredited computer camps in Greenfield, Mass., and Stroudsburg, Pa., this year: "Our curriculum is the most extensive and sophisticated of computer camps." In addition to the host of sporting activities available in the camps, campers get individual attention and assessment, and take placement interviews the first day of camp. Atari charges \$990 for two weeks of camp, \$1790 for four weeks, \$2990 for eight weeks. (The camp also charges along a declining fee scale for additional weeks beyond the minimum of two weeks). A six-to-one camper-to-counselor ratio, and a full-time computing staff are cited as value received for the price.

Other less expensive camps offer some similar services, although even "comparable" camps vary a great deal. One week at Sun Valley Computer Camp, for example, costs \$350; and \$195 for day students. (The camp will operate two sessions this August at selected sites. For information write Sun Valley Computer Camp, Hailey, ID 83333, 208-788-2164). This excludes

transportation to and from the camp, but includes lodging, food, computers, instruction, supervision, nature studies, and an eight-to-one camper-to-counselor ratio.

The National Computer Camps, now a five-camp organization in Connecticut, Georgia, Missouri, Ohio and Oregon, charges \$380 per week for all facilities (recreation is available, but optional). Denison Bollay's The Original Computer Camp, Inc., starts at \$795 per two weeks, and goes up depending on camp location and dates of enrollment (four weeks may run from \$1195 to \$2200.) The Champlain College Computer Camp starts even higher, at \$895 for two weeks, and runs to \$1600 for a full four-week session.

By point of contrast, two weeks at Camps Talcott or McAlister, in Huguenot, New York—both YMCA/YWCA of Greater New York camps—costs \$390 in the height of the season, and an additional \$125 for a special two-hour-per-day computer instruction program. A week at Club Med's facility in Eleuthera, Bahamas, where members and their children can take a five day, go-at-your-own rate computer literacy course, costs about \$829 for adults, including the charter flight and transfers from New York (\$30 additional Club Med annual membership dues for adults). Children from 4 to 12 stay at the Club Med "mini village" on Eleuthera for half-price, and get 25 percent off on airfare.

A quick glance at these rates shows that camps offering computer instruction *do* charge more than traditional camps, although in Club Med's case, the computers come inclusive in the price for a vacation stay. Most specialty computer camps, though, charge higher rates because they are offering that special commodity: computer expertise. What you're paying for at his camps, argues The Original Computer Camp's Denison Bollay, is a 20-man, full-time, year-round organizational staff, constant curriculum modification, even the development of specialized software.

ity of computer instruction.

Most camps represent one kind of trade-off or another: teaching style, computer- and counselor-to-camper ratio, quality of instruction and price. All will vary from camp to camp. On the one hand, parents must be concerned that the instruction is worth the cost. On the other, there is the question of balanced activities.

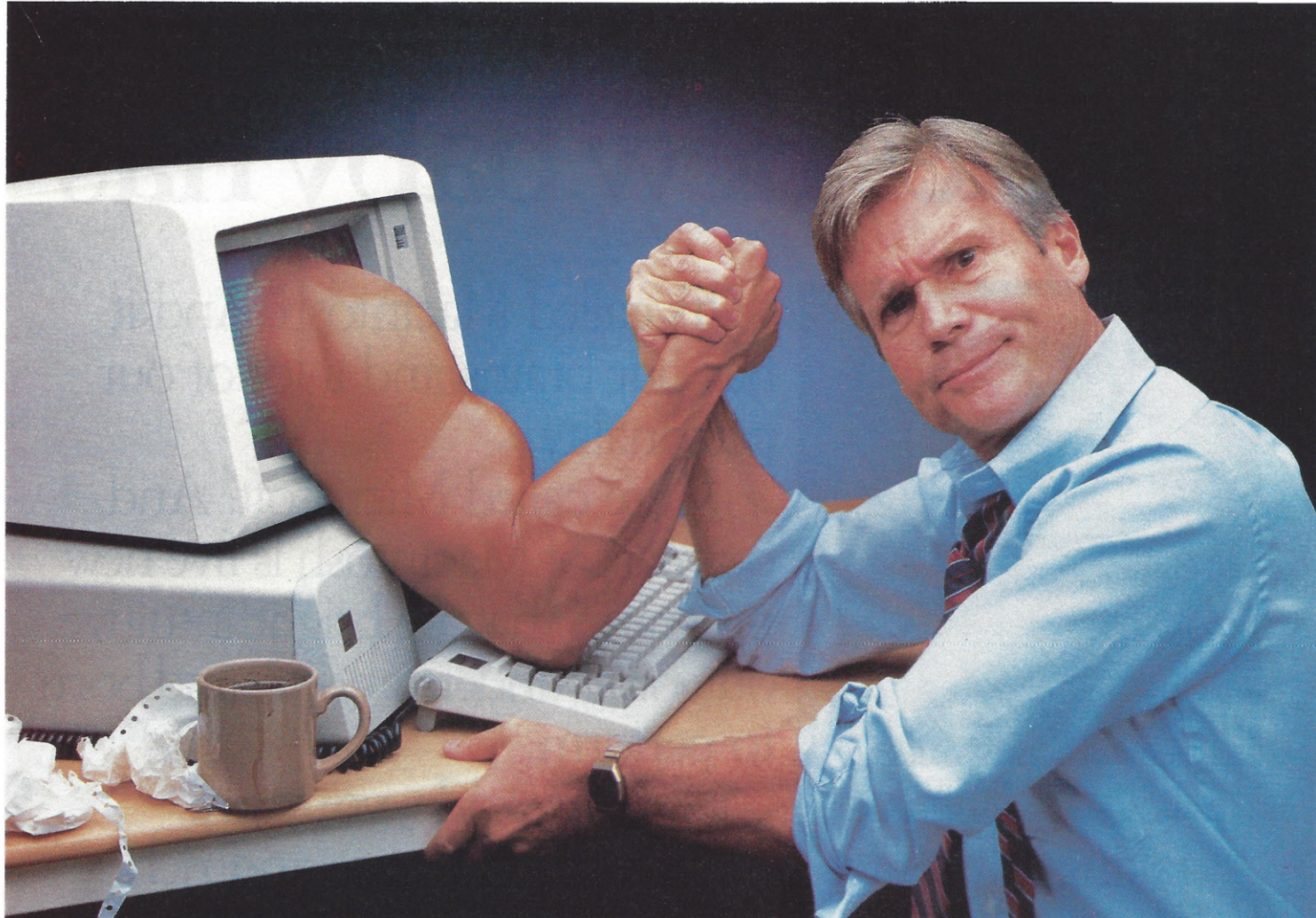
"The kids do tend to get hooked," acknowledges Dennis Dempsey, a co-director of the Sun Valley Computer Camp in Hailey, Idaho. "We don't *want* them to spend nine hours a day in front of the computer, which is what they'd do if we let them. We have to say 'No more, we're going swimming.'" But some kids actually sneak back into the computer rooms for more, Dempsey says. To Brad Thode, a Sun Valley Computer Camp co-director, the issue grinds down to that balance between computers and all the other things in the world. "Kids will be kids," Thode acknowledges. "They get into one thing until they're ready to drop. But if you can wave a carrot in front of them, then they'll get interested and they'll pursue other activities. The carrot, in Sun Valley's case, is environmental and wilderness studies, in addition to hiking, swimming and computing.

What constitutes a "rounded education" at other computer camps is a matter of some dispute. Most camps assert they have limited time in which to teach computing, and many are committed to offering all the traditional camping activities as well. How do they draw the line?

To Dr. Michael Zabinsky, executive director and founder of the National Computer Camps, which offers five camps in Georgia, Missouri, Connecticut, Oregon and Ohio, the focus should clearly favor the computer. Kids get five hours of instruction plus up to *five free hours* of computer time a day. "Recreation is elective, on a daily basis," he says. "A good balance (of recreation and com-

*(continued on page 88)*





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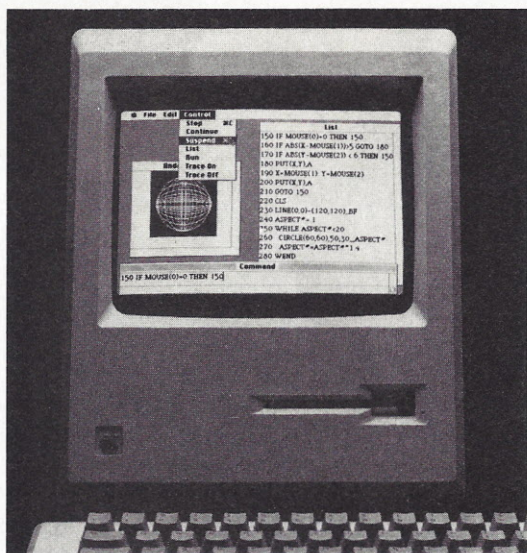
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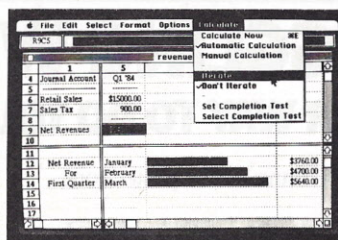
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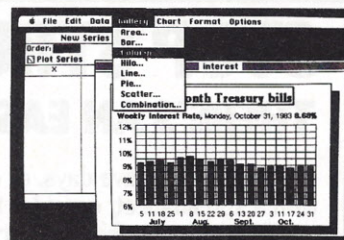
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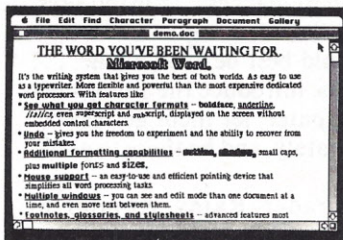
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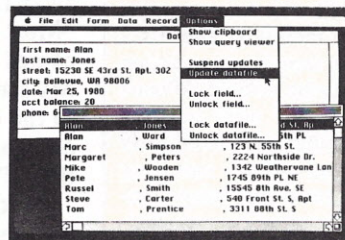
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## ADULT COMPUTER CAMPS

**I**magine learning about computers while riding on a gentle trade wind or floating in a sea of boiled anemones. It can happen. As an adult, you can do just about anything if you have the money—and the gall. That's why the famous organization that offers "the antidote for civilization"—Club Med, Inc.—now provides "computering" under the sun as well. In the words of Edwina Arnold, a Club Med public relations specialist in New York City: "Adults tend to be intimidated by computers. But if people are going to make computers work for them, they'll have to be interested in making them their slaves."

Club Med offers a glitzy, no-extra-cost, and quite attractive way for intimidated adults to boogie on down to the water and get their computing feet wet. In sites as diverse as Caravelle, Guadeloupe; Copper Mountain, Colorado; Ixtapa, Mexico; or Cherating, Malaysia, members of Club Med (known as GMs—gentils membres) can now get a five-day computer workshop and literacy course on friendly Atari computers, conducted by even friendlier GOs (gentils organisateurs) who know their computers and will make sure you don't suffer too much trying to learn them. According to one GO, Jean Noel Guilhem, who operates out of the Eleuthera (the Bahamas) site, and was quoted in the September 1982 issue of *Working Woman*, "The first thing you have to know is that the computer is a really dumb and stupid machine." After that, it's all downhill.

The Club Med computering program does no more or less than demystify the computer and provide some rudimentary computer knowledge, according to descriptions of the program included in the Club Med press packet. On the first day, GMs get introduced to the computers—a stone's throw from the beach—learning some basic terms, booting a disk, and then advancing to some graphics programming (second day). They go on to making music on the computer, drawing pictures, manip-

ulating simple variables (like how you want to allocate your monthly stock dividends) and writing programs with up to 20 lines of code. Finally, as a graduation exercise, computerists write a numbers guessing game, or a game of similar import. By the end of the course the more enterprising adults will also be running VisiCalc and have a handle on a word processing program. Not bad for five days, oui?

The attire for the course is casual—bathing suits and bare feet. Classes are in the afternoons, so there's no limit on sunburn. This year, 12 sites will offer computer workshops, and several of these, in turn, will provide the famous Club Med "Mini Club" for children, so that they can avail themselves of the computers also. "There's no extra cost (for the computer facilities) and it's a wonderful way for families to vacation together," says Edwina Arnold. What's more, the "Mini Clubs" offer separate activities and computer time, even early meals, so kids and adults can stay comfortably together while being comfortably apart. (Computer courses, incidentally, are conducted in four major languages: French, English, Spanish or Italian; the courses may extend beyond the week if adults and kids choose.)

For adults who don't wish to go the Club Med route, there are other alternatives, of course. Hundreds of colleges and private schools offer computer education programs for adults in the summer (check your local listings). Even some kid's computer camps are now expanding their range of activities to include "adult" and "family" computing weekends. Among these are The Original Computer Camp, Inc., which offers a year-round "high-tech, high-touch" family learning experience in a resort atmosphere. The Midwest Computer Camp (Indianapolis, Ind.) also offers an adult learning program. Contact them (see the listing on page 93) for more information. And if your favorite kid's computing camp isn't offering a program for adults, ask them: Why not?

(continued from page 84)

puters) should be available but need not be required."

To Dr. Elizabeth Russell, an educational consultant on the advisory board of The Original Computer Camp, Inc., an organization running seven specialty camps around the country, the value of a computer camp shouldn't be measured by the hours spent at a computer, but by the quality of that time. She calls the computer camp a "model for education," in which kids explore the possibilities of the computer while engaging in "healthful recreational development."

Russell's observations are drawn from her experience at three computer camps she attended last summer. "I learned a lot more than I bargained for, and the kids were far and away the best teachers," Russell says. "Most of the teaching at computer camps would best be left undone. . . . My sense is, introduce the youngsters to the computer, let them get hands-on immediately, and be there to guide them."

Sixth-grader Rainy Zweifel of Ketchum, Idaho, couldn't agree more. Last summer Rainy attended her first computer camp at Sun Valley, and to her the experience meant making friends, hiking in the mountains and "learning the programming concepts and making stuff easier," much of the time by herself, although usually under the watchful eye of some expert teachers like Dempsey and Thode (who are year-round educators in the Ketchum/Hailey area). "We worked a lot in Logo and BASIC, and we had to design our own programs that would make a picture of a game," Rainy reports. In addition, she wrote a letter home "on a disk and processed it out," played volleyball, watched movies like "Star Trek II," and got her share of starry nights in the Boulder Mountains with 100 other campers ages 8 to 16.

"Fun is very important aspect of camping," asserts Denison Bollay,



*After nine hours, some kids actually try to sneak back into the computer rooms for more.*

founder and chairman of the board of The Original Computer Camps, Inc., which operates camps from Lake Winnisquam, N.H., to Sequoia, California. "This isn't a school," he continues, referring to his own camps. "You want to have fun and learn. Fun frees the mind to learn *more*."

Unfortunately, many camps don't commit themselves to those values, according to Bollay and other camping directors we spoke with. "I'd be aware of the high-minded professors," Bollay says, "who talk down to their kids in COBOL." But Bollay also warns parents to be suspicious of camps touting "keyboard" or literacy skills—when actually they do no more than wave a few computers in front of kids and let them bang on the keys. "Computer literacy: I'm beginning to hate those words," Bollay says dryly. "Camps that exploit the literacy concept are simply taking advantage of the computer craze. Especially if they have no organized plan of instruction."

In spite of the obvious distinction, scores of storefronts are billed as "computer camps" in which quickie courses in BASIC and Logo are given. Tandy Corporation (Radio Shack), for example, is once again touting its storefront TRS-80 "com-



Photograph courtesy of The Original Computer Camp

puter camp" concept this summer—actually a two-hour per day, five-day inclusive course in Logo or BASIC, which will be taught to youngsters in the classrooms of 430 Radio Shack Computer Centers around the country. Tandy seems to have no qualms about calling the \$49.95 program a "camp," even though there may not be a tree or a lake within miles. (However, "campers" do get a Radio Shack T-shirt.)

A recent brochure circulated by the Midwest Computer Camp, a year-round residential facility near

Indianapolis, charges that "many stores offer 'camps' during the summer for young people where the primary purpose is the display of merchandise the vendor has on sale." By point of contrast, declares Frank R. Unum, Midwest's camp director: "We are a camp, accredited by the American Camping Association, a residential camp facility offering a rural and rugged five acres of wildlife refuge and 100 different kinds of animals." At Midwest Computer Camp, kids and adults can come to camp and get six hours a day of intensive timing loops, debugging and problem-solving in BASIC and Assembly language, in addition to hiking, archery, arts and crafts.

There are some parental aids in making the finer distinctions. One source book, *Summer Opportunities for Kids and Teenagers* (Peterson's Guides, \$9.95) clearly divides computer opportunities into two fields, listing "computer science—academic courses" in both the United States and foreign countries (numbering over 150) and "computer camps and programs" (numbering over 115). The guide also provides brief (but not judgmental) descriptions of the particulars of the camps: facilities, fees, age groups, accreditation, dates and

*(continued on page 93)*

## HOW TO PICK THE RIGHT COMPUTER CAMP

1. Decide on the level of computer involvement and the overall activities mix that will be right for your child.
2. To establish a list of candidate camps and narrow it down geographically, use the listing included in this article (page 93), plus the following source books: *Parents' Guide to Accredited Camps* (American Camping Assn., Bradford Wood, Martinsville, IN 46151; \$6.95 with postage, \$8.95 in Alaska, Canada, Puerto Rico and Mexico); *Summer Opportunities for Kids and Teenagers* (Peterson's Guides, \$9.95 in most bookstores).
3. Contact selected camps to interview directors and ask key questions concerning staff, curriculum, other activities and facilities. Also ask if names of alumni campers and parents are available as references.
4. If possible, visit the camp.
5. If you are still unable to make a final decision, consider a professional camp consulting firm. Two of the most active are: Student Camps and Trips Advisors, 244 Bonad Rd., Chestnut Hill, MA 02107, (617) 469-0681; and, Camp Advisory Services, 18 E. 41st St., New York, NY 10017, (212) 696-0499.



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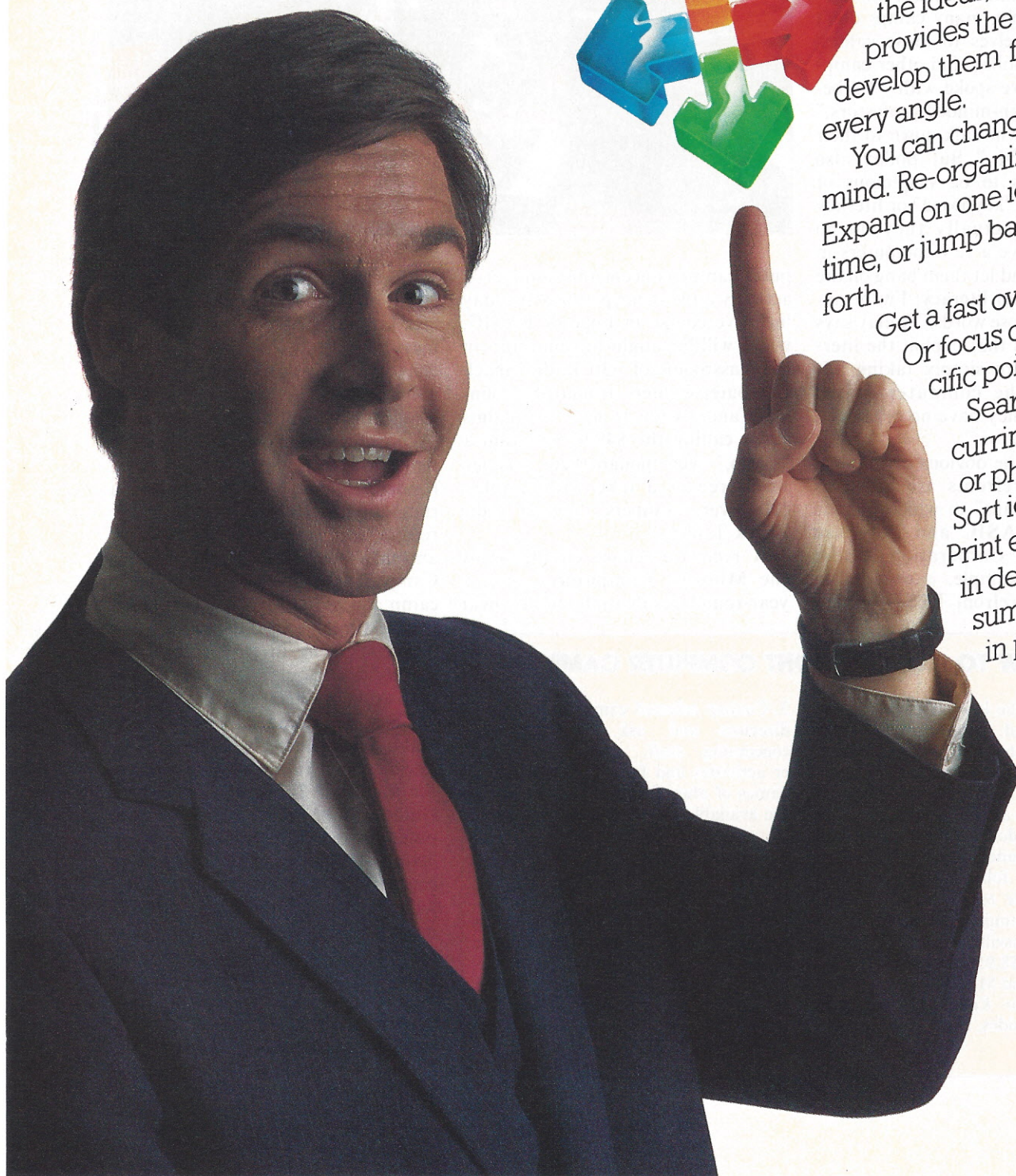


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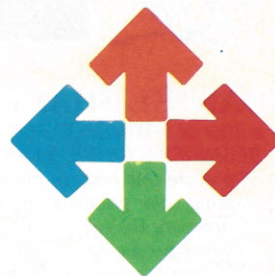
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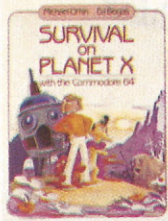
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author of *SURVIVAL ON PLANET X FOR THE COMMODORE 64*. \$12.95  
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*Michael Orkin*



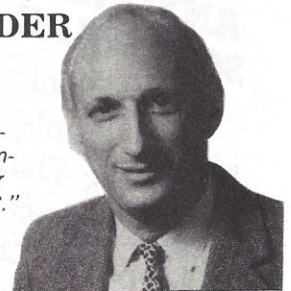
MICHAEL ORKIN



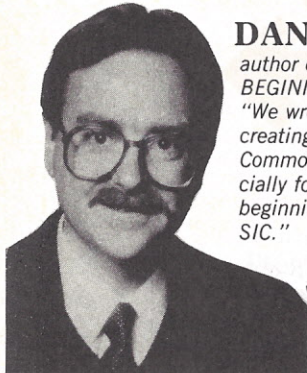
## DAVID SCHNEIDER

author of *HANDBOOK OF BASIC FOR THE COMMODORE 64*. \$19.95  
"This reference manual, containing several hundred examples, sets a new standard for the documentation of BASIC."

*David J. Schneider*



DAVID SCHNEIDER

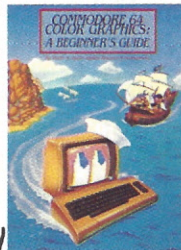


DANIEL SHAFFER

## DANIEL SHAFFER

author of *COMMODORE 64 COLOR GRAPHICS: A BEGINNER'S GUIDE*. \$14.95  
"We wrote this book to make creating color graphics on the Commodore 64 easy—especially for people who are just beginning to program in BASIC."

*Daniel Shaffer*



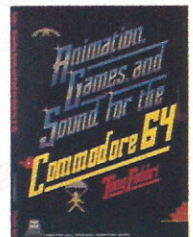
TONY FABBRI

## TONY FABBRI

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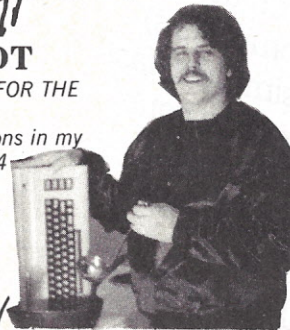
*Tony Fabbri*



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*Bill Behrendt*



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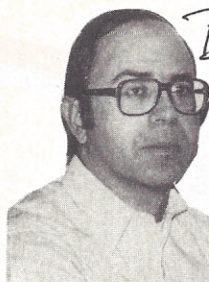
author of *COMMODORE 64: INTRODUCTION TO BASIC PROGRAMMING*. \$14.95

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LARRY J. GOLDSTEIN

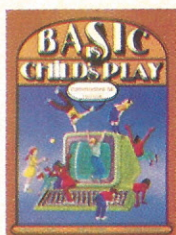


HANK LIBRACH

## HANK LIBRACH

author of *USING THE COMMODORE 64 IN THE HOME*, \$10.95, with disk \$29.95  
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*Hank Librach*

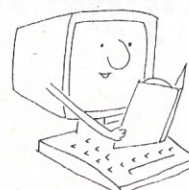


## ROBERT GRAUER

author of *BASIC IS CHILD'S PLAY: COMMODORE 64 VERSION*. \$16.95  
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CIRCLE 33



*No matter what the environment,  
the traditions of summer are  
changing because of computers.*

## EDUCATION

(continued from page 89)


where to write for more information.

A new "tradition" of computer camping may evolve in its own right. Bollay's The Original Computer Camp, Inc., for example, is going into its fourth year, expanding rapidly, with camps that boast a highly refined curriculum, customized teaching software (produced by a year-round staff), any of four or five languages and 20 "R2D2-type programmable robots." The Champlain College Computer Camp, in Burlington, Vt., now in its third year, offers a distinctly "New England" approach, featuring culture, camping and technology. Kids who attend the camp, for example, study anything from Beginning BASIC to FORTRAN for four hours a day, but also have more than 25 other camping activities to choose from, according to camp director Maureen Genzlinger. Those range from sing-alongs and

"ultimate Frisbee" games to canoeing, scavenger hunts and overnight camp-outs in state parks (although regular accommodations are in Victorian-style houses). There are also visits to the theater and nearby computer facilities—IBM and Digital, to name two.

The major traditional camping organizations are just beginning to incorporate computers into their camping agendas. This year, for example, the Boy Scouts and Girl Scouts of America, Greater New York Councils, the New York Urban Development Corporation, as well as the YMCA-YWCA Camps of Greater New York and the Greater Bridgeport (Conn.) YMCA (to name just a few), will be among those groups offering computer instruction to campers, as much as two hours a day of intensive work. "There's been a demand for it," notes Kent Sampson, director of camping and conference

center service for the YMCA-YWCA Camps of Greater New York. "But two hours a day is enough in this type of setting," he says. "This is supposed to be an educational experience in a recreational environment."

No matter what environment—camps and computers, computers and camps, private schools, universities, cabins on lakes—the traditions of summer are changing because of computers. But camps are still camps, in the meat-and-potatoes sense we're all familiar with: They not only provide that "special" experience where an interested or even gifted child can hone a set of skills—like music camps, sports camps, or "finishing" camps for that matter—they're also places where kids meet to have fun, to do silly things and to discover something about their physical, mental and social potentials in the process. 

### CAMPS AND COMPUTER EDUCATION SERVICES

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Eleuthera (Bahamas)—has Mini  
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For information on these camps  
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Mount Vernon College  
Washington, DC 20007  
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Bronx, NY 10462  
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# The Sound Of Software

New programs help you understand music and turn  
your computer into an instrument

by Paul Bonner, Senior Editor

As beneficial as many of us find spreadsheets, word processing, and other productivity software to be, there comes a time in almost any computer user's life when you begin to yearn for something totally new, something to open up purely creative pathways. Luckily, there *are* such products in the computer world. And music software is an excellent generic example. These are packages that, quite simply, enhance your comprehension and, therefore, your appreciation of music. This means that aspects of musical mastery it used to take talented individuals long hours of study to achieve are now within reach of the person with ordinary abilities—plus the right combination of hardware and software.

The category of music packages for personal computers stretches from software programs which even a raw beginner can use right up to hardware and software combinations sophisticated enough to be part of the professional musician's arsenal. The aims of the products at each end of this spectrum are different. The simpler ones primarily try to introduce a newcomer to the structure and organization of music, while the more complex are able to transform an Apple II or a Commodore 64, for example, into key components in a performance-quality musical instrument system. At the top of this scale are hardware/software combinations

for the Apple II such as the Alpha-Syntauri synthesizer from Syntauri Corporation, and the Soundchaser synthesizer from Passport Designs. With the dimension of computer control added to electronic music technology, these systems are becoming familiar parts of the recording studio's basic "board"—in fact, they can even be used to *simulate* a recording studio.

## Entry points

At the opposite end of the spectrum from the programs and hardware that seek to transform computers into professional performance instruments are programs designed with the newcomer to music in mind. Although many of the programs for beginners are used chiefly to teach children, youthfulness is not a prerequisite for using any of them. They only require that the user exhibit a willingness to have some fun with music.

That may be asking a lot from those of us who remember all too well the interminable hours spent at music lessons during childhood; hours that seemed to establish beyond a doubt that we were tone-deaf and hopelessly deficient in manual dexterity. In other words, totally incompetent at something that everybody (adults) had promised would be fun.

Today's introductory-level music software packages may finally offer a

new, far easier and far more entertaining way to study and practice the musical arts. Thus, for anyone who ever wished that those early lessons had "taken"—that he or she could somehow get as much pure joy out of *making* music as out of listening to it—these packages offer another chance, and one that might well be worth taking. It's quite evident from our conversations with the developers of most of these programs that they expect a certain amount of the market to result from renewed enthusiasm in once-failed instrumentalists. That is, the kind of person for whom the old saw, "They laughed when I sat down to play . . ." is no joke.

Gerri Brioso, president of the Dovetail Group which produces the Jazz Scats series for CBS Software, says: "We wanted people to have fun with music, to have a chance to appreciate it and play with it before they get intimidated. So many times people who have had the wrong introduction to music find themselves years later saying, 'Gee, I wish I'd had . . .'"

Art Bardige, president of Learningways, Inc., who with co-author Sam Wantman wrote *Songwriter* (published by Scarborough Systems), feels that, "Ninety percent of people can't learn music by traditional methods," citing the complexity of conventional musical notation and the difficulty of traditional train-



*Music software ranges from beginner's programs to packages sophisticated enough for the professional musician.*



Illustration by Ed Sorel



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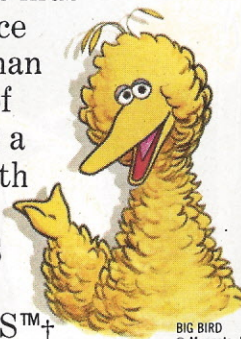
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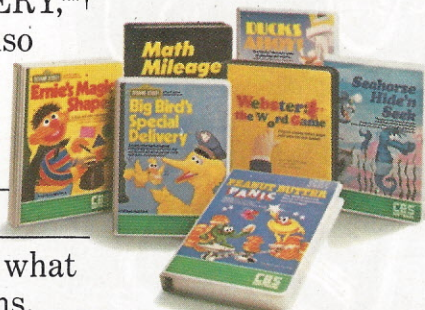
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ing methods. Sounding genuinely pleased, he adds, "I think that Songwriter actually can help both kids and adults pick up this thing that for most of us has been impossible."

Stewart Bonn of Electronic Arts, who worked with author Will Harvey to produce Music Construction Set, adds, "One thing that most people have in common is that they enjoy music. The thing that has prevented them from being involved in it is the inability to play an instrument. When we researched this product we found an incredible number of people who had one or two years experience with music and would categorize it as a frustrating experience. So, we tried to create a program that in a very simple, straightforward way would allow people to experiment with music . . . the kind of thing you can have a lot of fun with."

### *Playing around*

The driving force behind mankind's first experiments with music was probably no more complicated than someone wanting to have some fun making noise. And even today, for all the complexities and theories that permeate the world of music, that probably remains the primary motivation whenever somebody risks being laughed at by sitting down to play. As Gerri Briosio says, "It's like when you bring home a little toy trumpet or a xylophone for a kid, and they just sit there and play. They don't know what they're doing, but for them it's fun. It's experimentation."

Unfortunately, that motivation often gets lost in the standard music teaching methodology—for a lot of reasons: the intolerance of adult ears; the complexity of modern musical instruments; the years of tradition that have culminated in our present music education system. So the fun of making noise is soon lost as the novice confronts a demanding, confusing, and often all-too-dry curriculum filled with the bewildering new topics

of musical notation, keys, scales and the like.

One of the first tasks of a basic music software program, therefore, is to restore the rewards of making noise, then to quickly demonstrate the further rewards of making *organized* noise. At the same time, it usually manages to make the resulting noise a little less offensive to tender adult ears than plastic bugles or aluminum pot lids.

Various music software packages approach this goal in different ways. Perhaps the simplest approach is that taken by the three programs in the

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*"We wanted people  
to have fun with  
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and play with it."*

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Jazz Scats series (Cocoa Notes, Movie Musical Madness and Halftime Battling Bands). Unlike other packages, these programs don't attempt to provide you with a means to compose or analyze music so much as with a way to have fun with it. All the packages in the series are graced by the presence of three animated characters—the Jazz Scats—and all are intended, as Briosio says, "To let people have fun with music without having to know anything about it."

"We've attacked music in three different ways in the different packages," she continues. "In Cocoa Notes, which takes place on a tropical island, you 'fish' for notes to make a single line melody, to which we add an accompaniment and a rhythm pattern so it always sounds good. No matter what you do you really can't sound bad and you can't compose the same tune twice.

"In Halftime Battling Bands you're putting together a march," she

says, "You have the choice of using march music or silly music. There's nothing wrong with silly music—it could be part of Beethoven's Fifth or one of the Brahms symphonies—but it sounds silly when you put it between the strains of a 4-4-6-8 rhythm." Finally, in Movie Musical Madness, "You're not composing music, but you're composing the score. We want to let people experiment with how music can evoke certain emotions and make one act a certain way. There's scary music, there's chase music, there's music for love scenes, and what you do is choose the sections of music and put them together and then have the characters on-screen act to it . . . So you're creating a whole movie. You're not only the musical director, you're the director and the producer and the actor. It's kind of what everybody in Hollywood wishes they could do."

Although the Jazz Scats series is obviously aimed at children, Briosio notes, "We get lots of adults over here who want to play. A lot of our friends in television totally love Movie Musical Madness, they're totally enthralled with it because they can make cartoons and movies immediately. They get very into picking their film scores and all that."

### *Digging in*

Playing with other people's music is fun, but perhaps even more fun is playing music of your own composition. And there are a lot of software packages designed to let you do just that, among them Music Construction Set and Songwriter. Although the authors of both programs have obviously taken pains to try to get their sound quality as high as possible, these programs are not capable of turning your computer into a slick performing instrument. Rather, they're intended to give you a chance to compose and arrange music as simply and enjoyably as possible.

Art Bardige says of Songwriter, "We didn't set this up as a musical



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CIRCLE 64





## A NEW WAY TO LOOK AT MUSIC

**A**lthough many systems of notation have been used to record musical ideas throughout history and in different cultures, one system has long been dominant—the familiar system of staves and clefs and notes with vertical tails. And thus it seems quite reasonable that most music software programs follow that notation system, displaying notes on the screen the same way they would be displayed on sheet music. But at least one program—Songwriter from Scarborough Systems—has abandoned that system, employing instead a graphic representation of music that resembles more than anything else the slots that represent notes on a player piano roll.

Art Bardige, president of Learningways Inc., the company that produced Songwriter, argues that there are good reasons for abandoning the conventional system of notation. First, he says, the standard method of music notation “doesn’t work on the screen. It looks pretty on the screen with the notes dancing around, but you can’t read them and can’t tell them apart because you don’t have the kind of resolution that you have with paper and pencil.” But a more important reason, he argues, is that “The present notation was developed as a shortcut for musicians. It wasn’t meant to teach people music or to help people think about music,” he says. “It was meant for people who already understood the relationships between notes.”

As a result, Bardige says, “A 16th note looks larger and more complicated than a whole note does in standard notation.” That didn’t make sense to Bardige or his co-author Sam Wantman. So, he says, “With Songwriter we felt we didn’t need to use the kind of notation that people use with paper and pencil, it’s unnecessary on a computer screen. So, what we tried to find was a musical notation that would show a 16th note in its relative size to a whole note.”

What they came up with, in Bardige’s words, “was a simpler notation system in which the notes look like player piano notes. The longer the note is the longer it is on the screen.

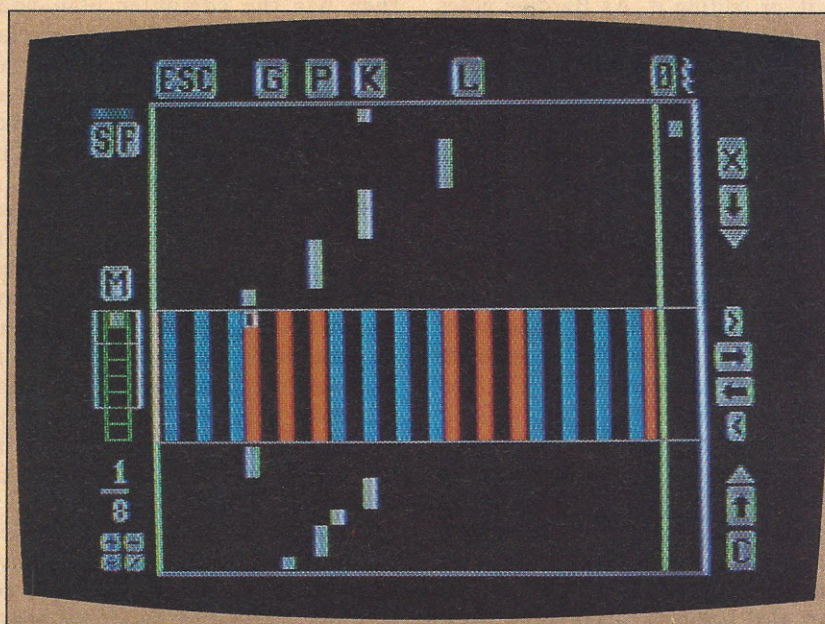
According to Bardige, it’s important that a notation system demonstrate music graphically because, “About 80 percent of the population are visual learners, while the other 20 percent are auditory learners. We wanted to reach that 80 percent, to show on the screen the relationships between sounds. We wanted the sound and the picture to go together, so that you can see what notes you’re on and understand where you are—visually and aurally.”

Bardige’s ideas sound good in theory, but how do they work out in practice. Very well, according to Karen Gremley, computer specialist for the Belmont, Mass., public schools. She says, “We’re using Songwriter in music classrooms. The teachers have found it great. What they had seen so far in music software was a lot of drill and practice stuff, and they found that wasn’t necessarily the best use of the computer. So now they think it’s great to be able to visualize music.”

Gremley notes that, “One teacher had some concern over the use of the color, and the fact that the black and white keys on a piano weren’t shown as black and white keys. But other teach-

ers found that wasn’t a problem. They just wanted the kids to see that the keyboard was a progression.” She feels that on-screen visual reinforcement is important, since it lets the children “see that one note is higher than another, to see as well as hear that one note is shorter.”

Still, one has to wonder whether the user of a music program that doesn’t employ conventional notation isn’t losing something in the bargain. Certainly, someone who wants to go on to more conventional methods of studying music would benefit from having learned standard music notation from a software program. On the other hand, Songwriter’s notation system does seem to be much more easily understood on an intuitive basis, and thus something that would help the user work with music more quickly. In any case, there does appear to be a trade-off involved, one that forces the nonmusician interested in trying music software to choose whether he wants to learn a complex system of notation that is compatible with that employed by the rest of the music world, or a simpler one that he can understand and use immediately.





instrument. It's not a Moog synthesizer, it's not designed for that. What it's designed for is to help people learn music. We try to give a sense of the organization and structure and thinking that's behind music, so that a kid can begin to think like a musician as he's learning this program. Not in a superficial way to crank notes out, but to think about the structure of music the way that a Bach or a John Lennon would."

"I think of Songwriter as a word processor for music," he adds. "It structures it for you because it confines you to musical sounds, so you begin to understand how music is constructed, and you begin to write it as if you were writing an English story or something."

Despite its impressive ambitions, Songwriter is exceptionally easy to use. Notes are played as you enter them from the keyboard, and they're displayed on the screen in a form reminiscent of the holes in a player piano roll (see "A New Way To Look At Music," page 99). When you're done with a song you can play it back in its entirety, and then have the option of saving it to disk, adding to it, or editing it. As Bardige notes, you can do "the most simple things with it, just put one note after another to play 'Row, Row, Row Your Boat ...'"

In addition, Bardige claims, Songwriter can "take you up to the most complex musical ideas. You can change the key signature. You can create musical motifs and play them at various points on the scale as a macro. You can change the scale. You know ... for most people the piano pattern seems like it's a fixed rigid thing, but in fact it isn't, it's sort of the Western pattern. You can experiment with the panatonic pattern—only the black keys—or you can have a pattern where you have three notes right next to one another and then a big jump. It's a lot of fun. You can also begin to understand music from other cultures."

In a similar vein, Electronic Arts' Music Construction Set, according to Stewart Bonn, has been designed "to let the inexperienced person grow with it." The support materials with that package, Bonn says, include, "a kind of introduction to music that briefly outlines what the elements of music composition are all about, what notes are all about, what the staff is all about, etc. The context for doing that is a series of experiments and games not too dissimilar from those with a chemistry set. Going

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*"I think of Songwriter  
as a word processor  
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structures it for you."*

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through it is a straightforward positive experience that most people have described as being a lot more fun than piano lessons."

With Music Construction Set, the user enters the notes in advance, and then has the computer play back what he's entered, while displaying the notes in standard musical notation on the screen. Bonn argues that this is a good way to learn what music is all about, because, "The computer keeps everyone honest ... If you put a note on the sheet music that's what the computer is going to play. It's not going to make a mistake. If you put it on sheet music and try to play it on a piano and it doesn't sound right you don't know if you're playing it wrong or if you're reading the sheet music wrong. That's frustrating. We've eliminated that. With the computer playing the notes you have a very honest referee."

There are a number of basic differences between Songwriter and Music Construction Set. Songwriter requires no add-on hardware (although the Apple version supports the use of

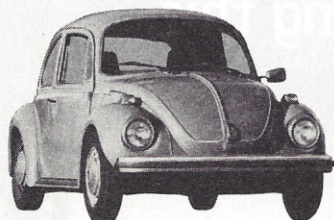
an external speaker and has a cable for that purpose), but generates only one musical "voice." Music Construction Set generates six "voices," but a Mockingboard (Sweet Micro Systems, Providence, R.I.) sound synthesizer is required to utilize all of its features on the Apple II.

Despite their differences, both programs have the same central purpose: to give you a sense of how music is organized, and to keep you aware of the structure of music from the moment you begin entering your first original notes. And the computer might provide an especially apt environment for that kind of experimentation and learning, because, as Bonn points out, "It's incredibly patient. It's not open to interpretation or mood, and it doesn't know that you just pounded on it because you were unhappy with the way something turned out."

There are some valid criticisms of "musical word processors," or at least of their merits as an introduction to a formal study of music. Gerri Briosio says that while "the musical word processor is terrific for composers because someone who can't play a Bach invention can program in all the notes and then have the computer play it back in the correct rhythm," these programs "don't give you a real understanding of music, because they don't give you an explanation of what you're doing. Not that you really need a formal explanation, you can just experiment by putting notes on a staff and you don't have to know that if there are not four beats in a measure you don't have a real measure. The computer seems quite tolerant of that—it doesn't know where one measure begins and another ends. In a sense you're getting a chance to play and experiment, but then suddenly there are a lot of rules in music, and if you essentially ignore them too long it may be hard to break the habit."

Chris Albano of Passport Designs is even more critical of this software,





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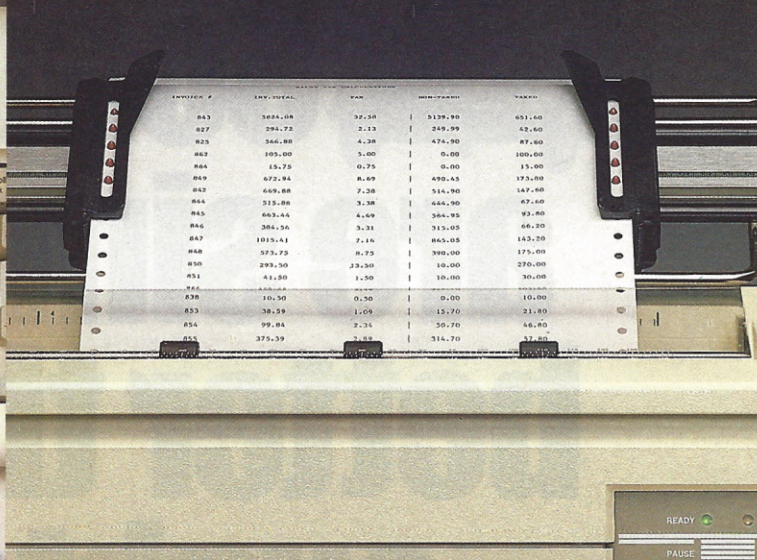
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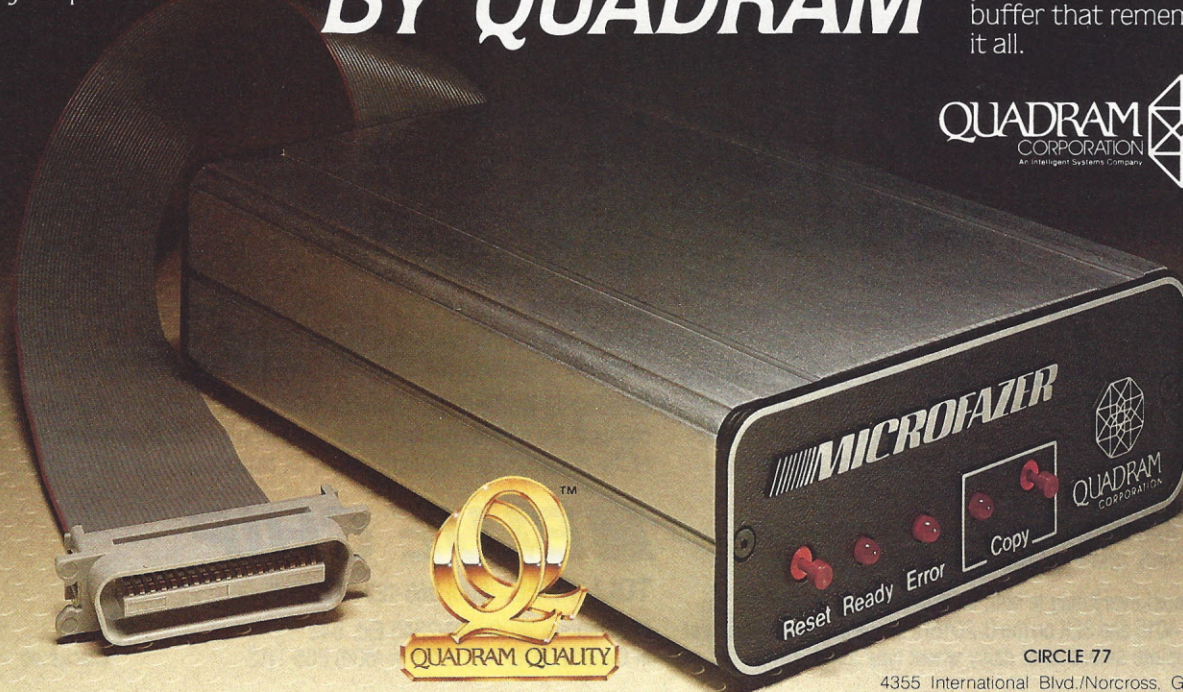
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"I've seen all the \$40 stuff. None of it has impressed me yet. What would impress me would be if a kid could sit down with a program and he could play Bach in six or eight months. That would impress me."

Albano draws a firm distinction between the person who is serious about music, and the person "who's just doing it for fun." He feels that "anybody who's just doing it for fun

eventually just throws the software into the closet like they throw their Casio keyboard into the closet."

How valid these criticisms really are would seem to depend on the use which the potential purchaser has in mind. These packages are not intended so much to replace traditional forms of learning music as to provide an alternative to them. It may well be that anyone who wishes to become a

concert pianist should stick to the classical study regimes. But at the same time, relatively few people have that ambition, and relatively few can reach that degree of skill even with the traditional forms of education. So if the alternative form offered by a "musical word processor" gives you more of a chance to enjoy music than you had before, then perhaps no further proof of its merit is necessary.

### MUSIC'S HEAVY HITTERS

**E**lectronic music is currently part of the commercial mainstream, as well as being firmly dug in on the fringe of the classical genre. Now, synthesizer-based systems like Soundchaser and AlphaSyntauri are beginning to exploit the full potential of integrated personal computer control.

The Soundchaser system, according to Chris Albano, Passport Designs' vice president of marketing, includes "a five-octave keyboard and a 16-oscillator digital synthesizer card. The keyboard interfaces with the card, which goes into the Apple. It has stereo output and a 'drum sync' port which allows you to interface to popular drum machines. The Apple provides the processing power to allow you to use screen graphics to help create your own sounds for multi-track recording, to print music, and use various music education software packages. We use the Apple as a software controller. With various packages, such as our Turbo-Tracks, you can simulate an entire 16-track recording studio and draw waveforms on the screen. With a program like our Polywriter you can play whatever you want on the keyboard, see it on the screen, then edit it and have it printed out in standard musical notation."

According to Albano, "a lot of professional musicians are using the Soundchaser. It basically has infiltrated all the top music markets. It's being used by established groups like The Grateful Dead as well as a lot of New Wave bands, plus a number of arrangers, and in Hollywood. It's also being used as a teaching system in universities, as well as by everyday amateur-type musicians who have an Apple. Because of the soft-

ware, the system isn't geared to any one individual segment of the market, because one group of people can use one package, and another group can use a different one."

In addition to the Soundchaser system, Albano says that Passport Designs is also "producing MIDI software. That's an acronym for Musical Instrument Digital Interface—what it basically does is give you a hardware interface to almost any commercially available synthesizer. We're doing that for the Commodore 64 as well as the Apple. It lets us hook up just about anybody's synthesizer to the Apple or Commodore, and lets us work with a whole lot of different keyboards."

As Albano says, Passport Designs is essentially looking at a high-end market. "For instance," he notes, "most of the synthesizers MIDI interfaces to cost between eight hundred and three or four thousand dollars." But he also believes that at least some of today's computers have potential for the person who wants to learn about music even without expensive add-on hardware. "I see a lot of future in computers with sound chips," he says. "Not for the pros, because the sound isn't hot enough for the pros, but for the home market."

One program that attempts to capitalize on that potential is MusiCalc1, for the Commodore 64 from Waveform Corporation. According to Waveform's national sales manager Tom Casar, musicians' magazines have seen fit to review it as something capable of turning the Commodore 64 into a musical instrument.

"The key thing for us," Casar says, "is to make it sound good. One problem

that we have in the computer field is that while we've raised people's expectations, most of the music software just doesn't sound very good."

"Still, we try to make it simple enough for kids, too," Casar adds. "There are three main things that we've included in the program to make it easy. First are preset sounds and instruments. These are instrument sounds and music developed by our in-house musicians that come on the disk. People can play along with them. The second thing is we give people a set of scales, because with certain songs when played with certain scales you cannot hit a wrong note. So we give them a scale where they can't hit a wrong note and sound out of tune while they're playing. The final thing is step-timed sequencing, so they're always in tempo."

Waveform developed MusiCalc1 for the Commodore 64 rather than for other machines, according to Casar, because "the Commodore 64 is the only one that can produce a professional sound. We are producing a program for the PCjr, but it will not have quite the sound capability that the Commodore 64 version has. We're also part of the Macintosh development. The Macintosh has a very good sound chip in it, so we should be able to do something with that."

Despite the presence of a dedicated sound chip in the Commodore 64, Casar admits that as a performing instrument, MusiCalc1 "is limited. But a trombone or a harmonica are also limited in what they can do, and that doesn't make them any less a musical instrument. The Commodore has a professional sound quality."

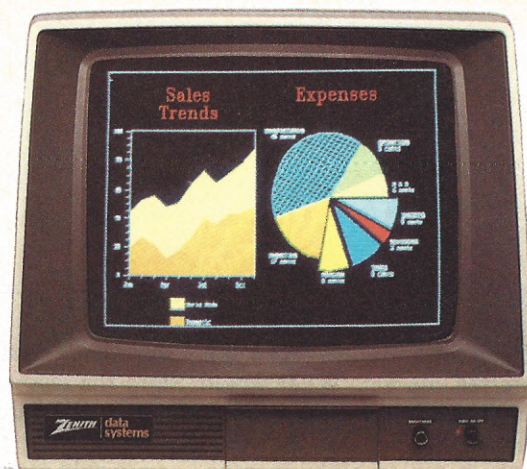


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ZVM-135: 80 column display. Audio feature ideal for expanded IBM PC Jr.

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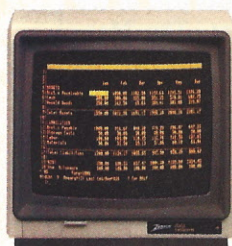
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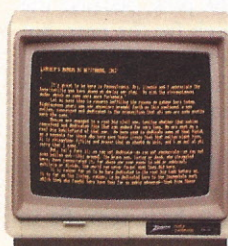
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ZVM-133: 80 column display. Ideal for IBM PC and compatibles.

CIRCLE 30

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# How Some Managers Buck The System

You can get around personal computer  
buying standards imposed from above.  
But you'd better be right.

by Kevin Strehlo, Senior Editor

*Last month, in the first installment of a three-part series exploring the issue of personal computer purchasing in large corporations, Personal Computing looked at a few examples of centralized buying. Part Two examines the buying procedures used by several corporations, where involvement on the part of individual managers ranges from superficial to heavy involvement.*

When corporate executives and managers began buying Apples and Radio Shack TRS-80s at the local computer store and expensing them as office supplies, the productivity gains that followed didn't go unnoticed. For better, and for worse in some companies, influential data processing departments now issue the edicts and control the purchase of personal computers. On the other hand, many companies have let the personal computing revolution progress unhindered: Users continue to purchase the hardware that suits them. Still, most corporate policy falls somewhere in between, in an attempt to produce the ideal corporate buying strategy. This elusive strategy would ideally leverage a company's bulk buying power and hierarchical support structure with the personal computer user's potential to be more creative and productive.

Wells Fargo Bank's commercial division, of San Francisco, Calif., is a good example of tightly reined centralized computer purchasing. A systems development group takes care of everything. The group buys direct from vendors in large volumes, and most likely has an IBM Personal Computer in inventory, ready to deliver to a manager upon request. Before they deliver, the group burns in machines—they even set up the hardware, and train the users. Later, if problems are encountered, a support person from the group can look into a data base and see exactly what they're dealing with, right down to the serial numbers of plug-in boards. Potential personal computer users don't even have to think hard to figure out which system to request.

"Managers don't actually come in and say they want a particular hardware and software combination," explains Kingsley Marr, an internal consultant for Wells Fargo. "They come in with a filled-out specifications form and we put together a quick prototype system for them." Often, Marr or another systems development group consultant will recommend a turn-key solution that uses a personal computer to tie to a mainframe, or a stand alone solution consisting of a customized application program stuck under an easy-to-use MS-DOS shell that hides the intricacies of the operating system.

Marr's boss, Don Betts, vice president in the commercial banking division, makes a convincing case for this approach. Highly paid professionals do not waste time learning how to use a personal computer, he claims.

Claude Stone, vice president in charge of the technology research unit for the First National Bank of Chicago, sees shortcomings, however. "Father knows best" thinking on the part of corporate data processing departments simply emulates practices from the past instead of taking advantage of personal computing's real strength: "the creative juices of the users. We've got to be more flexible," Stone says.

More typical than the purchasing methods at Wells Fargo, where managers have virtually no latitude, is a policy that offers managers a limited choice of personal computers and software. At Bank of America, the San Francisco based financial giant, the End User Group follows this tack. A centralized group of DP (data processing) and MIS (management information systems) people are charged with creating and maintaining a list of qualified vendors. And, as was the case with Wells Fargo, this group also provides considerable assistance for personal computer users throughout the organization. Recently the purchase and support of the bank's more than 500 personal



computers was put under End User Group auspices, along with similar responsibility for the bank's 9000 users of two mainframe-based time-sharing networks.

The End User Group at Bank of America is divided into several subgroups. One provides phone and field

"customers" inside the bank, using the other elements of the End User Group to discover whether new hardware and software meets those user needs sufficiently to justify adding it to the standard portfolio of supported products.

When a Bank of America manager

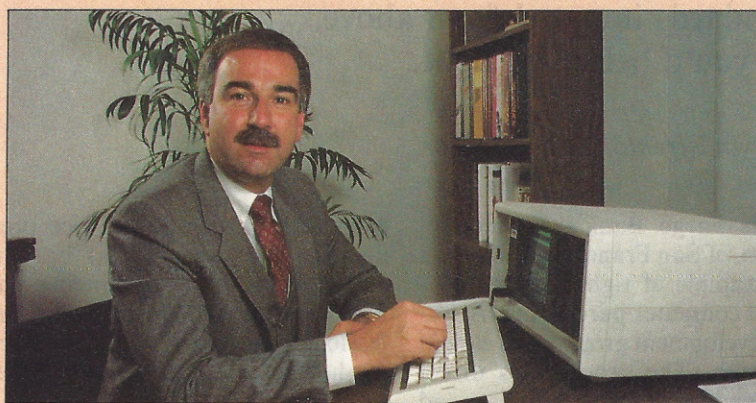
them to develop their own training and support," says Williamson. "And if anything goes wrong, it's between them and their vendor."

When it comes to software, it is relatively common for an individual in the bank to go out on their own without consulting the End User Group. When Suzanna Ross, a marketing manager in the treasury management services division of Bank of America, needed help setting up an application on her IBM Personal Computer, for example, the official data base management program for the bank's personal computers, dBASE II, seemed inappropriate. "I really tried to use it," Ross says, "but I didn't get very far." She needed a program easy enough to use so that data entry could be done by a temporary or a secretary, but she didn't have time to become a programming whiz and build a menu driven system in dBASE II.

Ross learned from her immediate superior that outside assistance was available as fast or faster than any she could get by way of the End User hotline. All she had to do was walk around the corner to the local branch of Businessland, a nationwide chain of computer retail outlets. She talked to the salesman who handled the Bank of America account, got a demonstration of several different data base management systems, and walked out with PFS:FILE on the strength of her bank ID and signature. Above a certain dollar amount that limits such purchases to software, she would have needed her superior's signature.

A case can be made for the need for compatibility among personal computers, perhaps, that makes standardization an important goal to be strived for. The most common argument for such standardization is that it is only a matter of time before all of a company's personal computers are linked into mainframes and the corporate data base, and allowing the

*(continued on page 114)*



***"Most orders of personal computers come from upper-level managers independent of data processing."***

**Anthony Paoni**  
Personal Computing Management

Photograph by Terry Lee/Black Star

support to various entities of the bank, when a problem is encountered, for example, with a Lotus 1-2-3 command. This part of the group fields 1500 weekly calls on the End User "hotline."

The second major subgroup is End User Resources, a second echelon of support behind the people who work directly with the end users. This subgroup is organized along product lines. For example, one person is expert on microcomputer hardware, another is in charge of word processing across both personal computers and the large time-sharing systems, and others are assigned to graphics, data bases, and custom applications. A third subgroup of the End User Group takes care of vendor relations and service contracts. Finally, there is the subgroup that does internal marketing to access the needs of its

seeks to purchase a personal computer, he writes up a description of the perceived need and a justification of the expenditure. That document goes to the technology arm of the End User Group, which recommends a solution from a standard portfolio. When a manager has in mind specific hardware and software that isn't part of the standard list, the recommended solution is subject to negotiation.

"You don't have to go with standard products. The manager just has to lay out a sound justification," says Derek Williamson, who is the End User Group liaison for bank executives. If a manager decides to purchase a non-standard product, however, the End User Group will not dedicate resources to it. In fact, they practically walk away from the user entirely. "The responsibility is on



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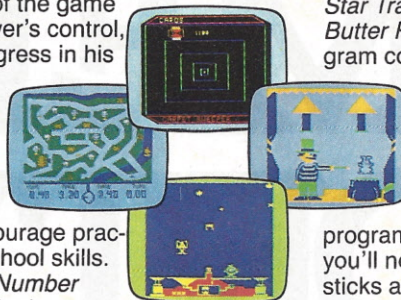
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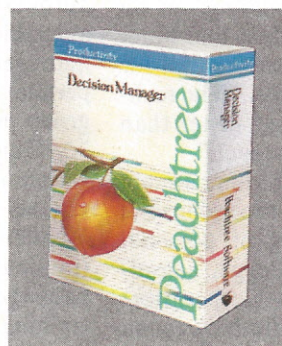
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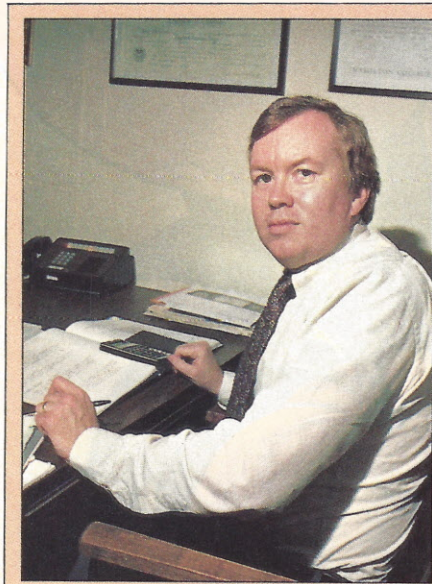
Phone \_\_\_\_\_



(continued from page 110)

purchase of any old personal computer will considerably complicate that task. But most often that need for compatibility exists at the local level, or perhaps at the departmental level, rather than corporation-wide. Derek Williamson of Bank of America

cause the department had chosen to design proprietary software for the Mac, SEACAS (Systems Evaluation Approach/Computerized Audit Support). That software is compatible, however, with virtually any main-frame Peat Marwick auditors are likely to run into.



*"Many large corporations have found that if people know who from their department was responsible for what ended up on their desk, they are more likely to accept it."*

**Ray Boggs**  
Venture Data Corporation

are more likely to accept it," he explains. Despite heightened sensitivity to the needs of personal computing users, Boggs says, DP/MIS staffers are still perceived as an alien influence, meaning "a machine just plopped down by DP will meet more resistance and is less likely to enhance productivity."

The more decentralized the management style of a company, the more influence that department level managers have on personal computing purchases. At TRW in Cleveland, Ohio, for example, Rick Kucia, supervisor of decision support systems, is in charge of all personal computer acquisitions. His decisions affect only the 450 or so people in the corporate headquarters building, and many of Kucia's decisions are in response to user requests. He increased the priority of personal computers in his budget at the suggestion of the user group he consults with regularly. "It's rare that there's a corporate-wide need to standardize on something—only for things like electronic mail, where it doesn't make sense to have more than one system," he says. When it comes to personal computing, the other functional groups of the giant corporation are independent.

At TRW's Space Park Complex in Redondo Beach, Calif., for example, the data processing purchasing of personal computers is entirely up to individual project managers. Ray Ybaeen, TRW's manager of office automation in Redondo Beach, is available for advice, and Ybaeen says managers usually call upon his expertise. Ybaeen's office automation group put together a brochure called "A Guide to Personal Computers," which makes recommendations on various hardware and software, and Ybaeen's department also makes training available on various software packages. But beyond advice and training, Ybaeen has no influence on a manager's personal computer purchase decision.

Ybaeen does control personal com-

points out that the computing done at his company is split about 20/80 between centralized and departmental computing.

Thus arises the kind of personal computing purchasing strategy seen at the New York accounting firm of Peat Marwick and Mitchell. The corporate tax department has standardized on the IBM Personal Computer, the consulting department encourages managers to use whatever personal computer they choose to, and the auditing department just bought 3500 Apple Macintoshes for use by its 7000 field auditors. After an intensive search that began in 1980, the Mac was chosen for its power, its portability, its ease of use and because the price was right. Compatibility with the rest of the firm's personal computers was irrelevant, since the field audit application was entirely self-contained and be-

Michael Treacy, a professor at MIT's Sloan School of Management, notes that such centrally enforced standardization is probably counterproductive. Companies that were standardizing on Apple IIs yesterday are standardizing on IBM Personal Computers today to the complete exclusion of Apple products, he says. "This means they're missing out on the benefits of Apple's Lisa and Macintosh, which may be substantial for some employees," he says. "The technology is simply evolving faster than these corporations can react."

Peat Marwick is not alone among large corporations that are eschewing centralized purchasing of personal computers says Ray Boggs, consultant for Venture Data Corporation. "Many large corporations have found that if people know someone from their department was responsible for what ended up on their desk, they

Photograph by Anshu/Gamma Liaison



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1. Plug the modem into a power source.
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4. Determine whether your computer is a DTE or DCE. (Check the manual if in doubt.)
5. Carefully open the case of your modem.

CAUTION: MAKE SURE THE POWER IS OFF BEFORE OPENING THE CASE.

6. Set the eight binary switches (consult your manual for details).
7. Carefully close the case.
8. Plug the telephone line into the modem.
9. Plug the modem into the computer.
10. Turn on the computer.

NOTE: IF YOU WANT TO SIMULATE VOICE DATA SWITCHING GO BUY ANOTHER ADAPTOR.

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CIRCLE 3

# POPCOM™

## MODEMS

### X100

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puter purchases, however, in his other role as manager of a billion dollar satellite project, one of many ongoing projects at the Space Park Complex. To that end, Ybaeen purchased 50 IBM Personal Computers, and put 100 people through a week of  $\frac{1}{2}$  day training sessions in their use. "The result is that a large number of people have become addicted to using the machines," Ybaeen says. Later, when this project ends and the people move to new projects within TRW, they will carry personal computing seed with them. "These are personally motivated people who are willing to put in the extra effort to learn about personal computers because they think personal computers will help them do their jobs better, and I make sure they get what they need."

United Technologies, in Hartford, Conn., also seeks to spread the use and purchase of personal computers to the various independent line groups that make up the company. John Bennett, corporate director of data processing, has taken an enlightened start-at-the-top approach. "That's on the theory that it's easier to pull a wet noodle down from the top than to push it up from the bottom," explains Ron Goldfarb, manager of office automation systems for the company's Pratt-Whitney jet engine division. United Technologies's top 1100 managers underwent a three-day course covering the fundamentals of personal computing using Context MBA (generic personal computing applications). They were given IBM Personal Computers to bring back to their offices.

The policies governing the purchase of personal computers vary a great deal within the United Technologies family of companies. "At Pratt-Whitney's corporate offices," says Goldfarb, "people don't have to swear that the computer is going to replace two secretaries or anything like that. In another division, on the other hand, where the head of data processing doles out computers, you

may get a personal computer in three months if you're lucky.

Anthony Paoni, president of Personal Computing Management in Wheaton, Ill., is one independent consultant who is seeing evidence of decentralized personal computer buying in a number of companies. Paoni has worked with such firms as Swift & Company and Keebler Cookies. "Most of the bulk orders of personal computers in corporations are in the range of 25 to 125 machines," he says, "and they are coming from upper-level managers independent of data processing."

One such manager is John Taussig, who runs the group charged with supporting personal computer users for Chandler Evans, a West Hartford, Conn.-based division of Colt Industries. Taussig has a background in industrial engineering, marketing, and finance, and that breadth of business experience was the key reason he was charged with the responsibility of buying and supporting personal computers for the 1000-plus employees in the division.

Taussig says several blessings flow to him from the autonomy Colt Industries allows its divisions. For one, his freedom to buy equipment from local computer retailers at a discount made it easy to go with an external hard disk for Chandler Evans' IBM Personal Computers, instead of the IBM XT that Taussig would have wound up with had he relied on a centralized, volume purchase from IBM. The local regional office of his computer retailer figures a discount for Chandler Evans based on the total volume of products purchased over 12 months. Taussig can even borrow and test products before buying. Better yet, says Taussig, the dealers support purchases with a policy of 48-hour repair or they swap the defective equipment for a working unit. "If corporate had purchased the Personal Computers direct, we'd be stuck with service out of IBM in New York," Taussig says "which would be

less responsive."

Taussig admits that there is a certain attraction to buying direct. But sometimes a purchasing agent's fondness for and familiarity with a regular vendor and its salesmen may cost a manager money and make him unhappy besides. George Kinghorn, who provides technical support for Texas Instruments' salesmen in California's Silicon Valley, tells of a department head at a Fortune 1000 company who requested Texas Instruments' Professional Computer and several software packages through the firm's purchasing department. Later, he discovered he had been overruled. The software came as requested, but the machines were IBM Personal Computers. Because the number of units was insufficient to qualify for a discount from IBM, the manager paid nearly \$1000 more per computer for machines he did not want in the first place.

Although it is usually true that the purchasing department will go direct and get the best price, managers may sometimes come up with a better deal. When John Bennett went to buy the 1100 IBM Personal Computers for his executive training program at United Technologies, for example, he discovered that Computerland of Connecticut would beat IBM's discount by five percent on anything Computerland carried. Moreover, Computerland agreed to assemble all the components and burn in the computers.

Sometimes it is service and support that wins a buyer's heart *despite* price. Bob Roenig, who heads up the Computerland effort to sell to large corporations in the Houston area, says his salesmen are often offering "the most expensive volume buy in town. On one bid we presented to a large oil company, IBM was giving twice the discount we were, but the company bought from us anyway," Roenig says. The reason so many non-DP department heads in some of



## COMING IN FUTURE ISSUES

### The Promise Of Electronic Mail

**W**hat impact is electronic mail having on the people who use it? Has it lived up to users' expectations? What can be done to make it work more effectively? Our July issue details the promises—and pitfalls—of this relatively new computing phenomenon, and offers guidelines to help you decide if it fits your communications needs.



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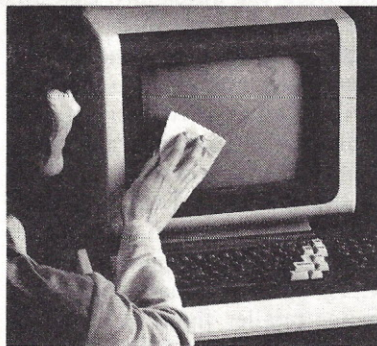
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CIRCLE 211

## CORPORATE/ BUSINESS

the largest corporations in the Houston area buy from Computerland, explains Roenig, is to get extensive support for the entire package. "If one of our customers wants to know how to make Lotus 1-2-3 automatically exchange data with dBASE II, they just have to call us," Roenig says.

### Shifting pendulums

It wasn't so long ago that Robin Wagner knew her request to set up an Apple-based data base application in the purchasing department of Fairchild Camera and Instrument was subject to review by a corporate steering committee composed of several vice presidents and staff from several departments, with MIS and production equally represented.

Since the acquisition of Fairchild by Schulerberger, however, Fairchild has become an extremely decentralized company, and no one group oversees the purchase of personal computers or anything else. "In the same way that each division is responsible for its profit and loss, each manager is responsible for whatever computers he chooses to bring in," says John Stiborek, the company's senior buyer. The lack of compatibility among the company machines does not present a problem because people who need to pass data back and forth tend to be part of the same department and buy the same machine. "The result is awesome—Wang Personal Computers tied to Wang mini-computers in one department, a network of IBM Personal Computers next door, a TeleVideo 8- and 16-bit network here, and down the hall a bunch of Apples linked into a Corvus hard disk."

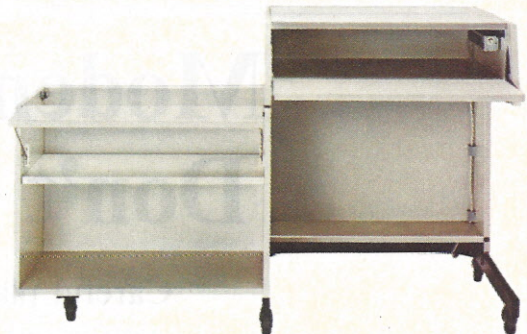
For the individual manager, the responsibility for personal computer purchases can be gratifying. "The beauty if it," says Stiborek, "is that the guy whose head will roll if the computers don't help him make a profit is the guy who gets to choose which computers to buy. That's great incentive for choosing well."



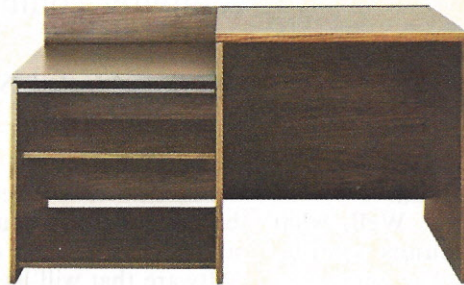
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# Modem Mistakes You Don't Have To Make

Careful planning and expert advice can help you avoid pitfalls on the road to successful computer communications.

*by David Gabel, Senior Editor*

**F**ind an ad for a modem and read it. Go ahead, I'll wait.

Good—you're back. Well, what did you think? Sounds simple, doesn't it? Just buy the thing and you're in business. You can use it to help get medical information if you're a doctor, to track the bloodlines of racehorses if you're an improver of the breed, to handle your investment portfolio, or to pick a restaurant for a business dinner on the opposite coast. It's all so easy. In fact, one ad even claims it's "extra easy."

The truth is, when you first start using a modem it isn't easy at all. It's a far more demanding instrument to master than its unassuming dimensions would lead you to suspect. But once you've gotten past the initial bewilderment—those pesky but essential details that people who sell modems have a way of forgetting to mention—using one *does* turn out to be a piece of cake. So the question is: How do you get from the initial state of confusion to dessert?

If you don't have someone around who knows modems and data communications, then you get over the rough spots by trial and error—consoling yourself in the knowledge that it will be a long time before you forget what you've learned. But let's try to make the trial and error period less of a trial.

There are four basic problems: 1) securing all the components you

need; 2) making the correct computer-modem-telephone connection; 3) bringing the modem under your operational control; and 4) choosing the software that will let you use its full capabilities in an efficient way.

Getting all the pieces you need is essential, because the modem can't do the whole chore by itself. Let's understand what that means.

Modems are designed to send data over the telephone lines. A telephone line is a sequential data channel. That means any messages are going to travel over the line in precise sequence, bit by essential (digital data) bit. This sequencing is known as "serial" transmission. The problem is, computers handle data bits in "parallel"—when a microprocessor moves them around internally, they go over parallel circuits eight or 16 bits at a time, depending on the number of data lines available to the microprocessor. You can think of serial data transmission as analogous to a line of cars on a one-lane road, while parallel transmission is like eight cars abreast on an eight-lane freeway.

If computers are to communicate with serial transmission lines, they have to change their internal parallel data to serial data. The device that accomplishes this is called a serial port. Common serial ports conform, in most important ways, to specifications promulgated by the Electronic Industries Association which are

called the RS-232 standard. Basically, it describes the format of the data coming from the port and the way the port is physically connected to external devices, such as a modem. The serial port presents the converted parallel data to the modem in the appropriate format at the appropriate speed.

The serial data still can't be sent over the phone line because it is only a sequenced group of voltage pulses. Such pulses have very high-frequency components in them, which cannot be effectively transmitted over conventional lines specifically designed to handle voice transmission. (This voice/data mutual exclusion has to do with phenomena shown by Fourier analysis, named for Frenchman Baron Jean Fourier, which reveals the complex structure of seemingly simple voltage pulses.) So the solution is to convert the pulses to another waveform, one that can be transmitted over the voice network.

In the strictest sense, that's exactly what a modem's basic function is. It takes the serial pulses coming from the RS-232 port and converts them to audio tones that can accurately carry the digital sequence over the phone lines. This process of conversion to audio is called modulation. The process of reconverting on the other end is called demodulation. A modem, therefore, is a modulator/demodulator.



*A modem can be a piece of cake—  
but only after you get through  
the initial bewilderment.*



Illustration by Jurek Wojdowicz



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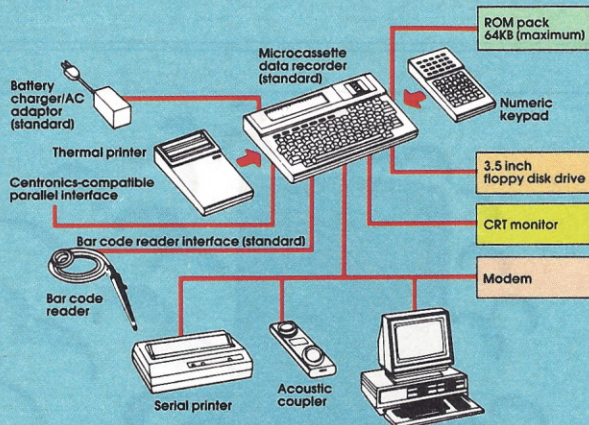
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What you need is complicated by the fact that some modems incorporate a serial port function on their circuit cards. Others don't. The latter must connect to a serial port on your computer. As basic as this may seem, when buying a modem you *must* be sure to ask if it needs to be connected to a separate serial card or not. Things are even more complicated because your computer may or may not have a built-in serial port. If it doesn't, either you buy one to add to it or get a type of modem that incorporates the function.

In either case, you now need the *right cable* to connect the modem to the port. Why should this present complications? It's because the RS-232 "standard" is only loosely observed. Some manufacturers choose to handle it differently. Again, you must insist at the time of purchase that the dealer provide you with the right cable. If it's not the right one, you may still be able to hook up the entire system. Of course it won't work—and now that you've read this you may have an inkling as to why.

#### ***The phone connection***

Once the modem is connected properly to the computer, it has to be connected to the telephone line. You'd think it's going to be a routine matter now that all telephone installations are moving to modular plugs. Wrong again. If you have a multi-line phone on your desk at the office, chances are that you can't connect the modem's modular plug directly to that phone. Multi-line phones normally have a large cable running to a multi-pin connector that connects the phone to the telephone lines. The large cable contains many twisted pairs for conversation, lighting the pushbuttons and ringer circuits.

There are at least three possible solutions. First, Radio Shack sells an adaptor that you insert in the middle of the connector and attach through a wire to a switch box. The switch box contains a modular tele-

phone connector. After inserting this adaptor into the telephone connector, you use the switch to bring one of the lines running through the connector to the modular plug. Thus you can conveniently switch your modem to one of the lines in your multi-line phone. If you don't like adaptors, take the second alternative and buy a modem of the type (for example, the Anchor Signalman) that connects directly to the telephone desk set and replaces the telephone handset when it's in use. Now you can switch the modem onto one of your telephone lines using the pushbuttons on the telephone. There's one other possibility if you don't like either of these options: Install a separate phone line with a modular connector. It's expensive, but effective.

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### ***With a modem and communications software, you can convert your computer into a "smart terminal."***

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Whichever option you choose, remember that you have to inform your local telephone company that you have equipment on the line that it didn't provide. The Federal Communications Commission requires this notification. Make sure the modem can connect to your phone setup, then call the phone company to tell it there's a modem on the line. They'll ask for the FCC number and the ringer equivalence. This information should be prominent in your modem's operations manual. Will the "Modem Police" arrive if you neglect to do this? Probably not, but if you have problems transmitting data later on—or if your modem causes interference on a neighbor's line—you're going to be dealing with the phone

company at some point and they are more likely to be cooperative if properly advised in advance.

#### ***Control the modem***

If you have decided to purchase a modem that connects to the telephone line with an acoustic coupler, then the above discussion of phone-line connection problems is academic. Acoustic couplers are the original, primitive modem form, and are more susceptible to garbled data problems than the direct-connect type. Interestingly, there are some sophisticated applications, such as file transmission direct from within some word processing programs, wherein a basic black, no-frills acoustic modem can "pose" as a printer and let you "out" in situations the automatic, direct-connect modems can't handle. But because of their greater accuracy and reliability, direct-connect modems are preferred by the majority of personal computer communicators.

Unless you are content with very simple communications, any modem you buy is going to need software control regardless of which connection system is used.

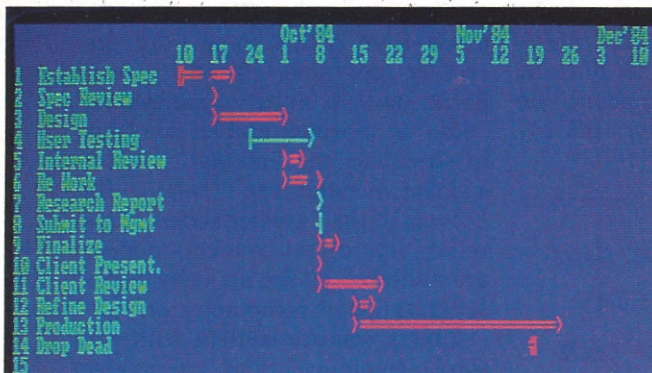
Direct-connect modems have a lot of utility, more than a telephone set. Many of them can answer the phone by themselves (auto-answer) as well as dial (auto-dial) to originate a call. Some even automatically switch speeds to match the speed of a calling modem. Some can reset their own communications parameters—the list goes on. But the message from this long list is simple; you must have control over all these functions or else they are essentially useless.

Modem functions are activated by firmware. Firmware is like software, with one important distinction: Software can be amended, updated and reshaped. You can edit a program, adding or deleting instructions to make the program do something else. But firmware is software—a program—that's been permanently written to a silicon memory chip and can



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only be read for execution. Modem firmware contains the instructions the modem needs to handle the chores like dialing and answering. You make the modem access its appropriate firmware by issuing its commands. The Micromodem II from Hayes Microcomputer Products has an attention command of CTRL-A. If the modem is turned on, which you do by addressing a command to its port and entering CTRL-A, the modem will signify its presence with a message on the screen.

There are three ways you can issue the proper commands to a modem. First, you can enter them from the keyboard by hitting the proper keys. This puts you in active control of the modem. Of course, you have to remember the commands or else have your user's manual handy. Second, you can write a program if you don't like constantly entering commands yourself. It isn't necessarily a good way to go. Modems are relatively complex peripherals and writing a BASIC program to make use of all their capabilities isn't the easiest programming task. For even a competent programmer, the time and effort needed to write a modem-control program is more than most of us can invest.

Fortunately, there's a third way. There are a lot of communications programs around. They work with a number of popular modems and they handle all the control chores for you. Suppose you wanted to call another computer in your office. With a communications program, all you have to do is enter the phone number of the other computer and tell your computer to dial the number. The program dials the number, sends its "originate" signal, waits for an answering signal and then informs you that you're connected when it knows the other modem is on line. It's a snap with a communications program.

There's also another advantage to a communications program. Most of

them transform your computer into a "smart terminal" capable of doing more than just accessing the telephone lines. By itself, a modem just lets your computer function as a "dumb terminal."

The distinction between smart and dumb, when applied to terminals, isn't a constant. Some smart terminals are smarter than others. Here's the basic idea: A smart terminal allows some activities beyond straight data communications, like saving text you've received over the telephone line to disk or reading a file

---

*If you anticipate and  
deal with the common  
pitfalls, you'll  
have fun  
with computer  
communications.*

---

from disk and transmitting it over the telephone line. On the other hand a dumb terminal simply functions like a telephone. No message recording, no fancy capabilities—just communications. If you have an ordinary telephone, you have to manually dial and answer the phone. You talk into it and must take notes if you want to remember the conversation. You have to do the same thing with a dumb terminal, which is what you get if you hook up a modem to a computer.

#### ***Getting it right***

Of course, the communications program has to know what you want to do—and that's where the problem arises. You have to configure the program for your computer and for the computer you're going to talk to. Configuring can be a problem.

There are a number of communications protocols that aren't standard. Which of them you use depends

on the way you want your communications to operate and the way the other computer wants to operate. If you want to communicate with one of the public information utilities, the utility will have its own set of communications parameters. You can communicate with The Source, for example, at 300 or 1200 baud, but the communications must be... "full duplex, with eight data bits, one stop bit and no parity checking." A communications program you buy will probably allow you to set these parameters. (Some programs assume some of the parameters, while others give you the option.) You set your program's parameters after requesting the communications parameters from the service you've subscribed to. The following is a good rule of thumb: If you know what a parameter should be, set it to that value; if you don't know what it should be or if you don't know what it is, let it remain set to the program's *default value*. Don't change the number of data bits in a word if you don't know why you're changing it.

In review, make sure you get all the hardware you need—a modem, a serial card (if necessary) and the cable to connect the two together. Get a communications program and figure out how to configure it by looking at the communications parameters of the computer you're trying to talk to. If you're talking to another individual's personal computer, you must negotiate the proper protocols.

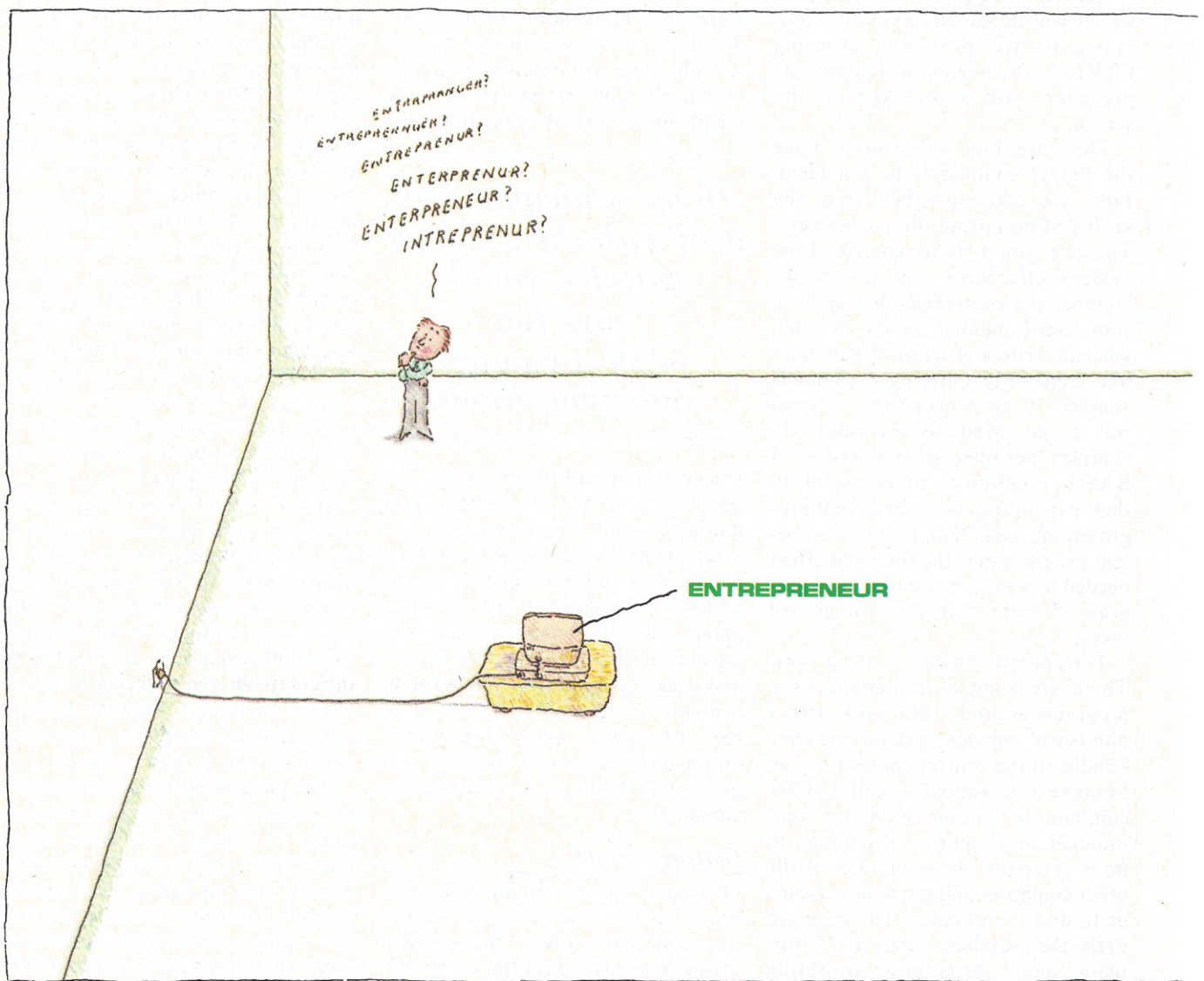
The purpose of this article is not to tell you everything, because what you need to know from here on is hardware- and software-specific. You'll have to spend time reading (and deciphering) your user's manuals. There are several good books on data communications on the market which will certainly aid your pursuit. But if you remember the common pitfalls to expect, you'll go from a state of confusion to quickly having fun with computer communications.

(see tables p. 130)



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## QUICK-REFERENCE GUIDE FOR CHOOSING A MODEM

(continued from page 125)

COMPANY	PRODUCT	SYSTEMS	PRICE
ANCHOR AUTOMATION 6624 Valjean Ave. Van Nuys, CA 91406 (213) 997-6493	Mark I	RS-232	\$99
	Mark II	ATA (850 interface)	\$99
	Mark II	TI 99/4A	\$139
	Mark IV	COM PET	\$169
	Mark V	OSB	\$129
	Mark VI	IBM PC	\$279
	Mark VII	RS-232	\$159
	Mark XII	RS-232	\$399
ANDERSON JACOBSON 521 Charcot Ave. San Jose, CA 95131 (408) 263-8520	Volks-modem	MPC (requires \$12.95 cable)	\$79.95
	AJ 4048	APC	\$2495
	1212-2H01	IBM PC, XT	\$425
	1212-ST	APC	\$495
	1212-AD1	APC	\$595
AT&T One Speedwell Ave. Morristown, NJ 07960 (201) 898-2000	1212-AD2	APC	\$695
	835	ATA (all)	\$279.95
	1030	ATA (all)	\$130.95
	103JR	RS-232	\$1190
BACUS 1440 Koll Circle San Jose, CA 95112 (408) 279-8711	AC 312	RS-232	\$145
BIZCOMP P.O. Box 7498 Menlo Park, CA 94026 (408) 745-1616	1012 Intelli-Modem	APC	\$549
	1022 Intelli-Modem	APC	\$549
	PC Intelli-Modem	IBM PC, compatibles	\$499
BYTCOM 2169 San Francisco Blvd. Suite H San Rafael, CA 94901 (800) 227-3254	212AD	RS-232	\$495
CAMPBELL SCIENTIFIC P.O. Box 551 Logan, UT 84321 (801) 753-2342	DC103A	RS-232	\$450
CERMETEK MICROELECTRONICS 1308 Borregas Ave. Sunnyvale, CA 94089 (408) 364-2003	Infomate	APC	\$595
CODEX 20 Cabot Blvd. Mansfield, MA 02048 (617) 364-2003	5103	APC	\$425
	5202	APC	\$475
	5212 Auto-call Unit	APC	\$645
COHERENT COMMUNICATIONS 60 Commerce Drive Hauppauge, NY 11788 (516) 231-1550	Linemate 96 Plus	APC	\$450
	SPM-94	APC	\$475

APC = all personal computers    HP = Hewlett Packard  
 APL = Apple    IBM = IBM Personal Computer  
 ATA = Atari    MPC = most personal computers  
 COM = Commodore    SYSTEMS = RS-232

*This chart shows the manufacturers of modems with their addresses and suggested retail price for each model.*

COMPANY	PRODUCT	SYSTEMS	PRICE
COMDATA CORP. 7900 N. Nagle Ave. Morton Grove, IL 60053 (312) 470-9600	212E2-32	APC	\$337
	305E2-12	APC	\$117
	370E-42	APC	\$277
COMMODORE 1200 Wilson Dr. Westchester, PA 19380 (215) 431-9100	Vic Modem	COM 64, VIC 20	\$99.99
	Auto Vic	COM 64, VIC 20	\$149.99
COMPUTER COMMUNICATIONS SPECIALISTS 6683 Jimmy Carter Blvd. Norcross, GA 30071 (404) 441-3114	CCS Audio Response Modem	IBM PC	\$28.95
COMPUTER DEVELOPMENT 6700 S.W. 105th Suite 200 Beaverton, OR 97005 (503) 646-1599	ET	RS-232	\$495
	ETC 2103	RS-232	\$1295
CONCORD DATA SYSTEMS 303 Bear Hill Rd. Waltham, MA 02154 (617) 890-1394	212	APC	\$720
DATEC INC. 200 Eastowne Dr. Suite 116 Chapel Hill, NC 27514 (919) 929-2135	PALPlus	IBM PC, XT, compatibles	\$599
	PAL 212	IBM PC, XT, compatibles	\$497
DEVELCON ELECTRONICS 4037 Swamp Rd. Doylestown, PA 18901 (215) 348-1900	6212 Smart-modem	APC	\$495
	8212	APC	\$650
DIGITAL EQUIPMENT CORP. 146 Main St. Maynard, MA 01754 (617) 897-5113	100 Modem Family	RS-232	\$545-\$3045
GANDALF 1019 S. Noel Ave. Wheeling, IL 60090 (312) 541-6060	SAM 212A	RS-232	\$618
HAYES MICROCOMPUTER PRODUCTS 5835 Peachtree Corners E. Norcross, GA 30092 (404) 449-8792	Smart modem 300	APC	\$289
	Smart modem 1200	APC	\$699
	Smart modem 1200B	APC	\$599
	Micro modem 100	APC	\$399
	Micro modem 11e	APC	\$329
INCOMM 115 N. Wolf Rd. Wheeling, IL 60090 (312) 459-8881	A1200	RS-232	\$499
	Starcom	RS-232	\$499
INFINITE INC. 6 Shattuck Rd. Andover, MA 01810 (617) 681-0600	CM2020 Direct Connect Card	APC	\$250
INMAC 130 South Wolfe Rd. Sunnyvale, CA 94086 (408) 737-7777	8071	APC	\$595
INTEGRATED DESIGN ENGINEERING 645 Anminister Dr. Fenton, MO 63026 (314) 343-0005	IDE-1200	NCR	\$500
	1200 Baud Modem 8070	APC	\$445
	Small Talk 300 Baud 8063	APC	\$149

(continued on page 134)





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### ***Why are some computers more compatible than others?***

IBM PC compatibility can be a very relative term.

For example, a computer featuring the same 8088 microprocessor as the IBM PC, but without the necessary compatible disk operating system is not IBM PC compatible. Nor are computers advertised as IBM compatible that use 3 1/2" floppy disks (the IBM PC's are 5 1/4") or magnetic bubble memories. While these computers claim IBM PC compatibility, they will not run software written for the IBM PC without modification.

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CIRCLE 24





## QUICK-REFERENCE GUIDE FOR CHOOSING A MODEM

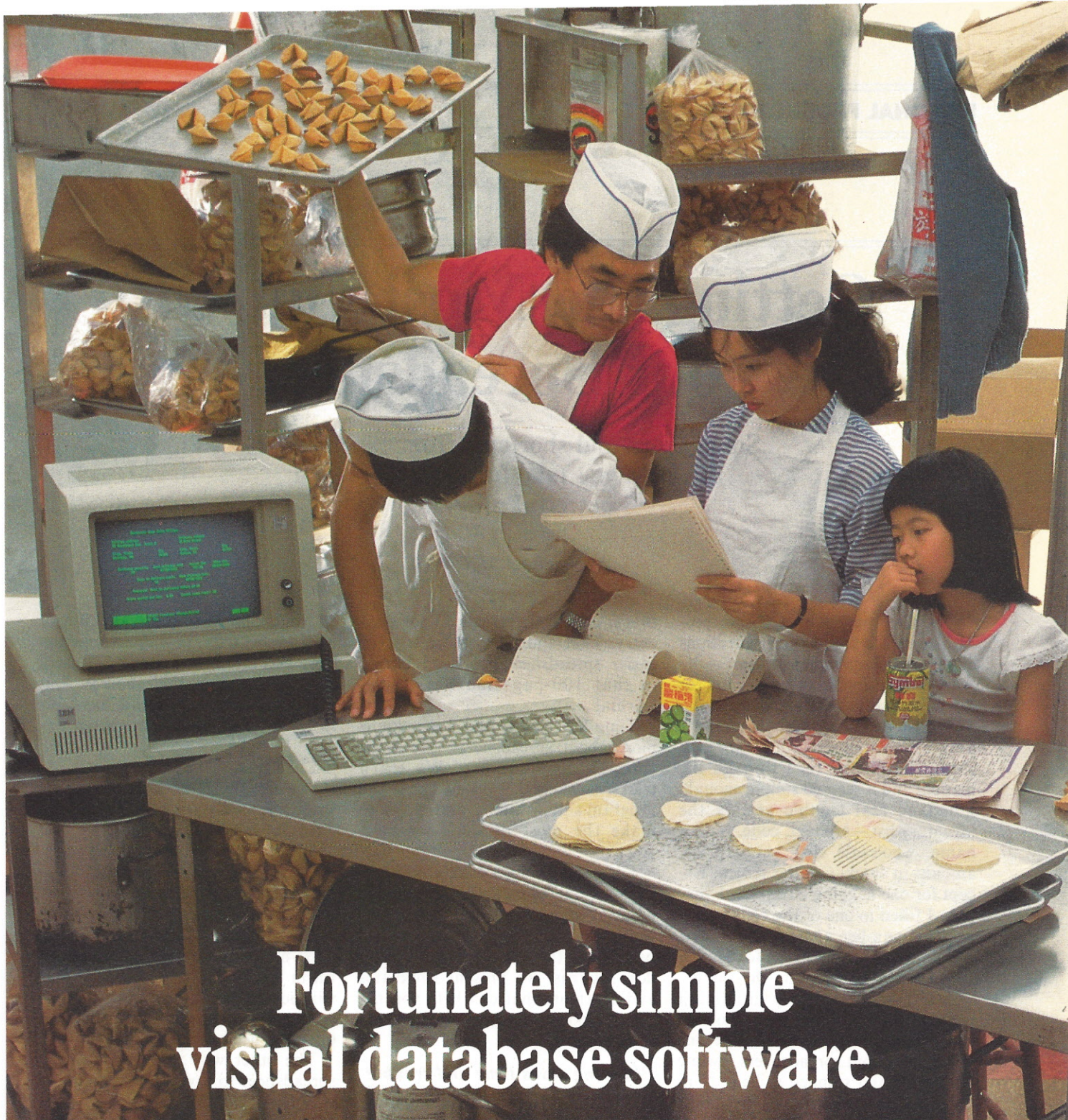
(continued from page 130)

COMPANY	PRODUCT	SYSTEMS	PRICE
LEXICON CORP. 1541 N.W. 65th Ave. Ft. Lauderdale, FL 33313 (305) 792-4400	LEX 10	APC	\$119
	LEX 11	APC	\$159
	LEX 11B	APC	\$199
	LEX 12	APC	\$179
MAGNATEC 101 Locust St. Hartford, CT 06114 (203) 242-3048	407C	APC	\$745
MFJ ENTERPRISES P.O. Box 494 Mississippi State, MS 39762 (800) 647-1800	MFJ-1232	RS-232	\$129
MICROCOM 1400 Providence Hwy. Norwood, MA 02062 (617) 762-9310	RX-1000	RS-232	\$895
	ERA-2	IBM PC, XT, jr; APL Ile	\$429
MICOM SYSTEMS INC. Silicon Valley Development Center 3393 Dela Cruz Blvd. Santa Clara, CA 95050 (408) 727-5275	MB80512	RS-232	\$550
	MB80514	RS-232	\$595
MICRO-PLEX INC. 1977 State College Blvd. Anaheim, CA 92806 (714) 978-0262	Versacom 300A	RS-232	\$119
MULTI-TECH SYSTEMS INC. 82 2nd Ave. S.E. New Brighton, MN 55112 (612) 631-3550	MT212AH	RS-232	\$549
	MT2129C	IBM PC, XT	\$549
	MT212PC	Multimodem PC MT212PC	
NEC AMERICA INC. 1012 Steward Ave. Sunnyvale, CA 94086 (408) 737-7711	Multi-Mod- em Ile	APL II, II+, Ile	\$329
	N212DR	RS-232	\$795
NESCO 107 San Zeno Way Sunnyvale, CA 94086 (408) 737-2080	N103JR	RS-232	\$460
	1200	RS-232	\$495
NOVATION 18664 Oxnard St. Tarzana, CA 91346 (800) 423-5419	1030	RS-232	\$595
	Applecat	APL II, II+, Ile	\$725
PENRIL CORP. Data Communications Div. 5520 Randolph Rd. Rockville, MD 20852 (800) 638-9302	Smart-Cat/ 103/212	RS-232	\$595
	PC Cat	RS-232	\$595
	300/1200	MPC	\$525
PRENTICE CORP. 266 Caspian Dr. P.O. Box 3544 Sunnyvale, CA 94088-3544 (408) 734-9810	8201-DM	MPC	\$795
	X-100	RS-232	\$475
PROCESSING INNOVATIONS INC. 10471 S. Brookhurst Anaheim, CA 92804 (714) 535-8161	Speech- Aided Modem	RS-232	\$50.95
PROMETHEUS PRODUCTS 45277 Fremont Blvd. Fremont, CA 94538 (415) 490-2370	Promodem 1200	APC	\$495

COMPANY	PRODUCT	SYSTEMS	PRICE
RACAL-VADIC 1525 McCarthy Blvd. Milpitas, CA 95035 (408) 946-2227	VI 1222	RS-232	\$975
RADIO SHACK Div. of Tandy Corp. 1800 One Tandy Center Fort Worth, TX 76102 (817) 390-3011	DC-1200	RS-232	\$699
RIXON INC. 2120 Industrial Pkwy. Silver Spring, MD 20904 (301) 622-2121	R103J	RS-232	\$249
	R212A Intel- ligent	RS-232	\$499
	PC212A	IBM PC, XT	\$499
TRANSEND CORP. 2190 Paragon Dr. San Jose, CA 95131 (408) 946-7400	Apple Mod- em Card	APL II+, Ile	\$325
	PC Modem Card	IBM PC, XT, com- patibles	\$549
TRI-DATA 505 E. Middlefield Rd. Mountain View, CA 94043 (415) 969-3700	Guardian 533	RS-232	\$750
UNIVERSAL DATA SYSTEMS 5000 Bradford Dr. Huntsville, AL 35085 (205) 837-8100	103 LP O/A	APC	\$145
U.S. ROBOTICS INC. 1035 W. Washington Chicago, IL 60607 (312) 733-0497	Password	RS-232	\$449
	Password 300	RS-232	\$199
	Personal Communi- cator	IBM PC, XT	\$499
	Personal Communi- cator Version 2	IBM PC, XT	\$699
	Personal Communi- cator Version 3	IBM PC, XT	\$999
	S-100	S-100	\$449
	Auto Dial 212A	RS-232	\$599
	Auto Link	RS-232	\$549
	PC Modem 1200	IBM PC, XT	\$499
	HP 150 Inter- nal Modem	HP-150	\$425
VEN-TEL INC. 2342 Walsh Ave. Santa Clara, CA 95051 (408) 727-5721	1200 Plus	RS-232	\$495
WANG LABORATORIES One Industrial Ave. Lowell, MA 01851 (617) 459-5000	WA3451	APC	\$1050
WESTERN DATACOM 5083 Market St. Youngstown, OH 44512 (216) 788-6583	212 Autodial	APC	\$625
	WorldCom 200	APC	\$495

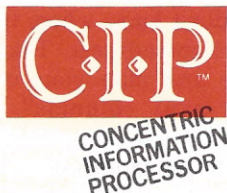






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---

# Getting The Most Out Of Your Spreadsheet

Some tricks and shortcuts from expert users  
can help you take full advantage of a  
powerful program.

*by Michael McCarthy*

**T**he first time I used a calc program, I learned the frustrations of the casual spreadsheet user.

I was entering an inventory list for a friend, using VisiCalc on a Radio Shack Model I personal computer. I didn't know much about spreadsheets, but I had read through the manual and it seemed simple enough. I had no real trouble getting the inventory list—product, code, vendor name, wholesale cost, retail price, amount in stock—on the screen. Except for one nagging irritation: Every time I filled in one of the cells with a word or number and pressed Enter, the computer would pause for several seconds before accepting the entry.

This made data entry difficult. I couldn't understand it: What took the computer so long? Finally, someone who knew about spreadsheets saw me struggling and stopped to help. "Try turning off automatic recalculation," he said. "Every time you make an entry, the computer checks every cell in the spreadsheet to see if anything needs updating. It's wasting your time."

Later I discovered that the explanation of automatic recalculation was in the manual. There was even a hint

---

*Michael McCarthy writes user manuals for Adam Osborne's Paperback Software Company, and is co-author of Thinking Small: The Buyer's Guide to Portable Computers.*

that it should be turned off for data entry. That and many more tips for easier spreadsheet use were buried in that 100-page manual. I was learning.

Time has passed and I now know more about spreadsheets. We learn through constant use. We learn tricks, shortcuts, ways to cheat the program's limitations and ways to make the most of the program's powers.

Fortunately, I've discovered that even casual users can easily learn many of the spreadsheet tricks that were previously reserved for the expert. With the help of some of calc-dom's gurus, we present some tips and shortcuts that can help you tap all the power in your spreadsheet program.

## ***Planning saves time and trouble***

Let's take advanced planning first. Steve Miller, publishing coordinator for Lotus Development Corporation, recommends that you sketch the layout of your spreadsheet on paper first. It sounds trivial, but he says beginners get into trouble just because they don't know where they're going with a spreadsheet. Take a piece of paper and map your overall plan. How many columns? How many rows? Should the months be across and the categories down or vice versa? Decide where to put your lookup tables, choose lists, data base areas

(if your calc does that) and if you need to sort data, how to arrange the rows and columns. Lotus 1-2-3 users need a place to put their macros. And every spreadsheet should have instructions and explanatory notes.

## ***Don't wait, automate!***

If you use the same kind of spreadsheet repeatedly you may be a candidate for another time-saver, the "boiler-plate" spreadsheet. If you always do 12-month projections, for example, there's no reason to type in the months every time. You can make up a master spreadsheet with the standard headings already entered then fill in the blanks when needed. This will not only save you entry time, it will standardize your work and reduce the need for planning.

The other way to automate your spreadsheet to save time and energy is to make use of the program's macros. Macros are commands that let you store a whole series of commands, then call them up in a few keystrokes. Many programs have macro-like capabilities: keystroke macros in Framework, keystroke memory in the VisiCalc Advanced Version, Execute in SuperCalc and the macro in Lotus 1-2-3. Dick Anderson, a computer consultant from Walnut Creek, Calif., uses spreadsheet programs to develop applications for his business clients. A true spreadsheet maven, he is author of



## Even casual spreadsheet users can easily learn many expert tricks and shortcuts.

*1-2-3 Tips, Tricks and Traps.* He uses 1-2-3 because its macros let him automate spreadsheets, making them easier for his clients to use. But he also uses the macros for his own convenience and offers this "quickie" as an example:

```
{?}{right}/XGX1
```

It seems that the numbers on the IBM Personal Computer numerical keypad double as cursor movement keys. You have to press the NUM LOCK key to switch back and forth between numbers and cursor movement, which is extra work and encourages mistakes. But Anderson puts the above macro in cell X1, enters his numbers and when he presses the Return key, the macro moves the cursor to the right. Then he only has to use the cursor arrow keys at the end of the row.

Steve Miller of Lotus offers a more elaborate macro that lets you enter numbers across the row, then automatically does a "carriage return" and puts you at the beginning of the next row.

```
{?}{down}{left}{left}{left}{left}  
/XGX1
```

X1 is where we put this macro. Use {left} as many times as needed. Position the cursor at the first cell for data entry. Invoke the macro and begin to enter your data using the arrow keys to move the cursor to the right. When you get to the end of the row, press Return instead of the arrow. The macro will advance over to the first cell of the next row. The macro will repeat indefinitely until you use CTRL BREAK to stop it.

Most newer calc programs have some form of macro (review your user manual to find it). If your program doesn't have a macro feature, try using your computer's programmable function keys, like those on the Osborne and the Kaypro, which can easily be assigned repetitive commands. Failing that, try the suggestion of Stan Trost, author of *Doing Business With VisiCalc* and

buy a program such as ProKey, (RoseSoft, Seattle, Wash.) which piggybacks on your calc program and lets you redefine any key on the keyboard.

### Formulas for success

Most people limit their spreadsheet formulas to adding columns of numbers. Even that can offer challenges in unusual situations. Here are some tips for using formulas in new ways or for solving old problems.

\*Rounding errors can create unexpected problems. When you calculate sales tax, for example, you want it rounded to dollars and cents. But the "dollar formatting" offered by spreadsheets doesn't actually round the numbers, it just displays rounded values. The computer retains the full,

unrounded numbers in memory and uses them on all subsequent calculations. That's the reason your sums may not add up. The solution is to make liberal use of your program's Round function in addition to dollar formatting.

But what if your calc program doesn't have a rounding function? A programming trick uses the Integer function to round the number; in this case, the number in A1 to two decimal places (dollars and cents)  $+ .05$  ensures that the number is rounded up or down as appropriate:

$\text{INT}((A1*100 + .05)/100)$

(Check your manual for the exact command: it's INT in SuperCalc and Multiplan and @INT in VisiCalc and Lotus.)

To round to *three* decimal places,

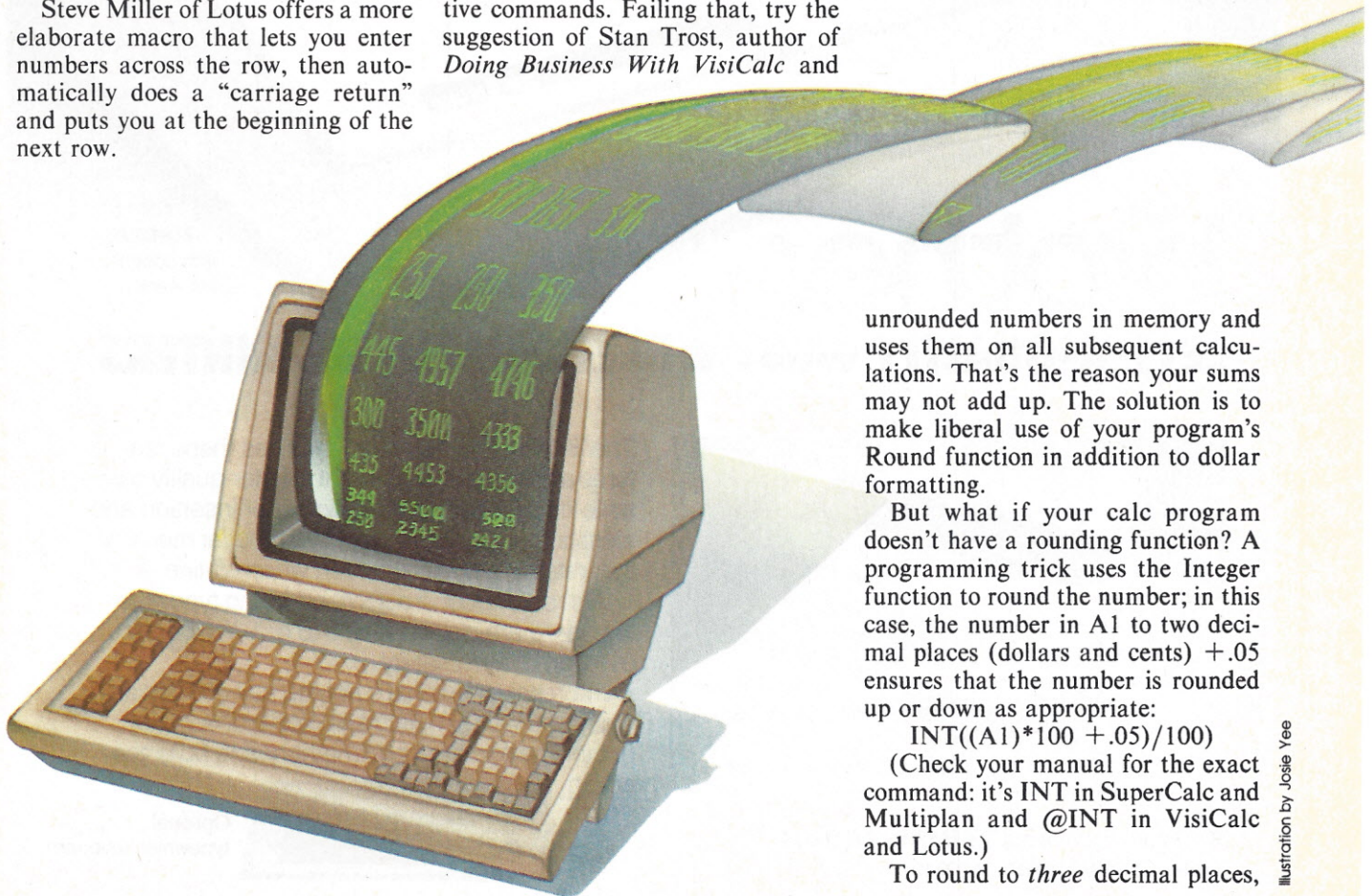


Illustration by Josie Yee



# WE HAVE LOTS OF COMPETITORS, BUT NO COMPETITION!

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And there's simply  
nothing else like it  
at the price.



HR-15  
illustrated  
with optional  
sheet feeder.

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### LETTER-QUALITY DAISY WHEEL COMPUTER PRINTERS



HR-25 Deluxe  
Letter-Quality Daisy Wheel  
Printer with parallel or RS-232C  
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The Brother HR-15 printer includes these features as standard equipment: a letter-quality cassette daisy wheel, automatic paper insertion and ejection, 2-color printing and a 3K buffer memory that retains information even when off-line.

A sheet-feeder, tractor-feeder and typewriter keyboard are also available to give the printer even greater versatility.

Impressive, but that's not the half of it. It's also equipped with a 4 pitch selector, bidirectional printing, automatic copy memory and boldface typing.



Optional  
typewriter keyboard.

For information about the Brother full line of  
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You can make a "boiler-plate" spreadsheet with the standard headings entered.

## PERSONAL PRODUCTIVITY

use 1000 instead of the 100s and .005 instead of .05. It's also possible to round to thousands (for example, 14,039 to 14,000) by changing the formula so it swaps divisions and multiplications:

$\text{INT}((A1)/1000+.5)*1000$

\*Dividing by zero creates errors because it's a mathematical impossibility. It shows up when you say "M10/M9" and M9 shows up unexpectedly as a zero. The result is

smaller than the smallest likely valid number.

\*Recalculation "Flag." Here's a trick that lets you selectively recalculate parts of your spreadsheet. Ordinarily when you order a recalculation the entire spreadsheet gets recalculated, even if you only want to check one area. But you may not want the whole sheet recalculated.

and label it "Recalculate? (1=Yes, 0=No)." Put a "0" in it. This is your Recalculate Flag cell and when it is changed to "1", the flagged cells will recalculate.

2) Add the following to the front of any formula on the spreadsheet that you want to recalculate only when the

the word Error in that cell and in every other cell that depends on it. Lotus 1-2-3 catches divide-by-zero errors, but for other programs two other formulas will avoid the problem. The first uses the If function, a very valuable device:

$M10/IF(M9=0,1,M9)$

(Your calc may use @IF instead of IF.) Don't let the If function scare you, it looks harder than it really is. Keith Sturdivant, customer support manager at Sorcim (makers of SuperCalc), suggests reading it aloud: "If M9 is zero, then divide using a '1'; otherwise, go ahead and use M9."

In other words, *if* the first item is true ("M9=0"), *then* use the second item; *otherwise*, use the third item (whatever the value in M9 is).

If If scares you (or doesn't seem to work), here's another approach:

$M10/MAX(1,M9)$

This means "Divide by either '1' or the value in M9, whichever is greater." If M9 is zero, then it'll pick by the one. (Your calc may use @MAX instead of MAX.) This works if you expect a positive integer value. Otherwise, use in place of "1" a number

Maybe you're entering customer data over several days and want to see the intermediate totals as you go, but not the grand totals until you're done. Or you have cells containing some slow functions, like logarithms, that take the computer a long time to run. With the following trick, suggested by the people at Sorcim, you can flag those cells so they'll only recalculate when you're ready for them.

1) Pick a cell in the upper left of your spreadsheet (let's say cell B2)

Flag is "on": "IF(B2=1,(formula),(cell))". Translated: If the "Recalculate Flag" (in cell B2) says "1", then calculate according to the formula. Otherwise, use the value already in this cell. Example: H6 has the formula "SUM(H3:H5)". Change this to "IF(B2=1,SUM(H3:H5),H6)".

3) Now when you're ready to recalculate, change the "0" to "1". All "flagged" values will recalculate.

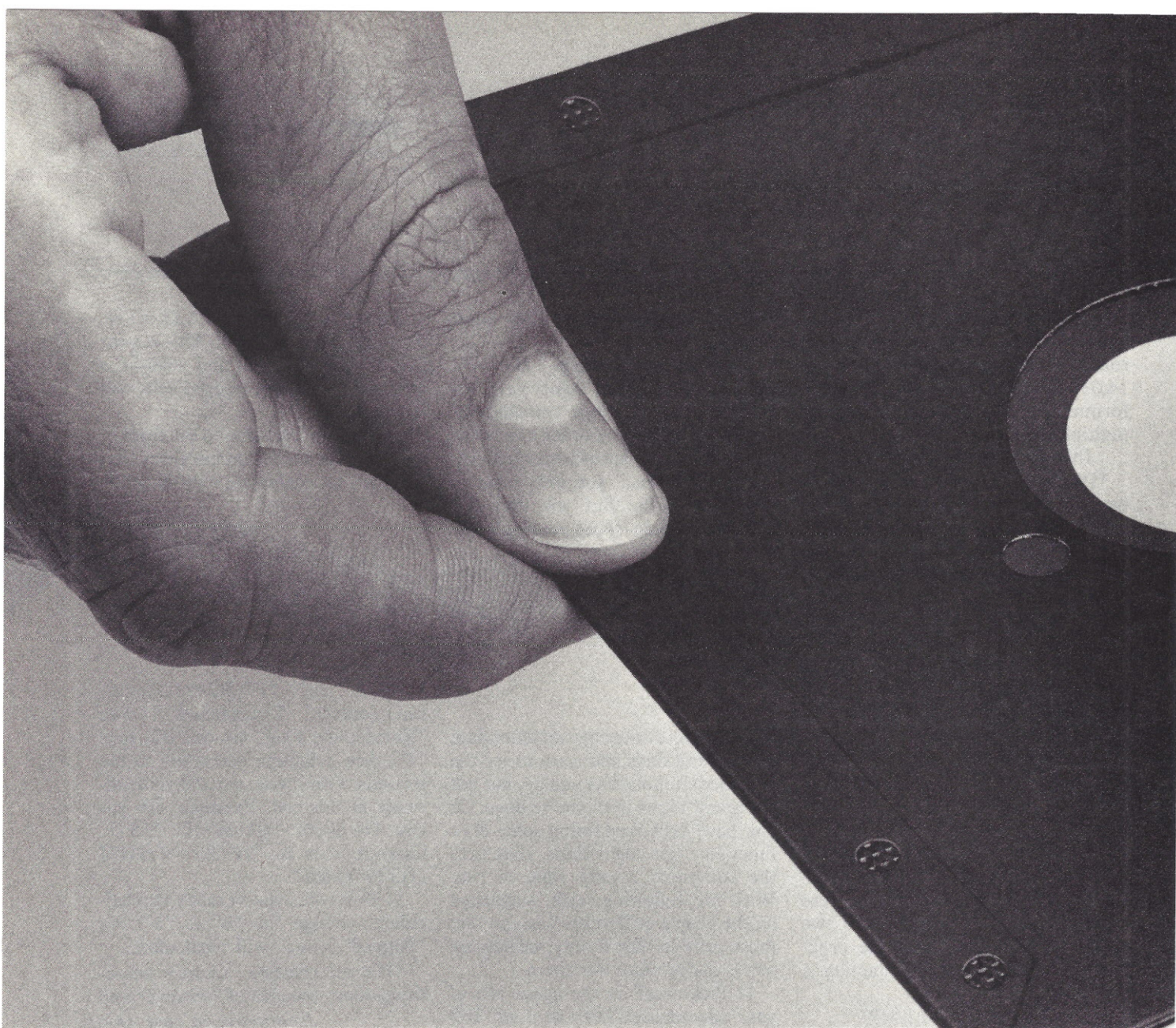
\*It's all relative: There's something about the idea of "relative" and  
(continued on page 143)

	Jan	Feb	Mar	Apr	May	Jun
Units Sold:	.00	.00	.00	.00	.00	.00
Net Sales	14000.00	14700.00	15435.00	16206.75	17017.09	17867.94
Per Unit	24.48	24.72	24.97	25.22	25.47	25.73
COG Per Unit	24.48	24.72	24.97	25.22	25.47	25.73
Profit	ERROR	ERROR	ERROR	ERROR	ERROR	ERROR
Fixed Costs	2200.00	2420.00	2662.00	2928.20	3221.02	3543.12
Net Profit	ERROR	ERROR	ERROR	ERROR	ERROR	ERROR

Text: "WHAT HAPPENS WHEN DIVIDING BY ZERO"  
Width: 20 Memory:123 Last Col/Row:013 ? for HELP  
F1 = Help; F2 = Erase Line/Return to Spreadsheet; F9 = Plot; F10 = View

Dividing by zero in a spreadsheet causes errors because it's an impossibility.





# This one sloppy floppy can

## THE SLOPPY FLOPPY

Most companies seal their discs with a spot here, a spot there. Leaving most of each seam not sealed at all.

Sooner or later, the seams might do what comes naturally: they bulge. Warp. Pucker. Open up.

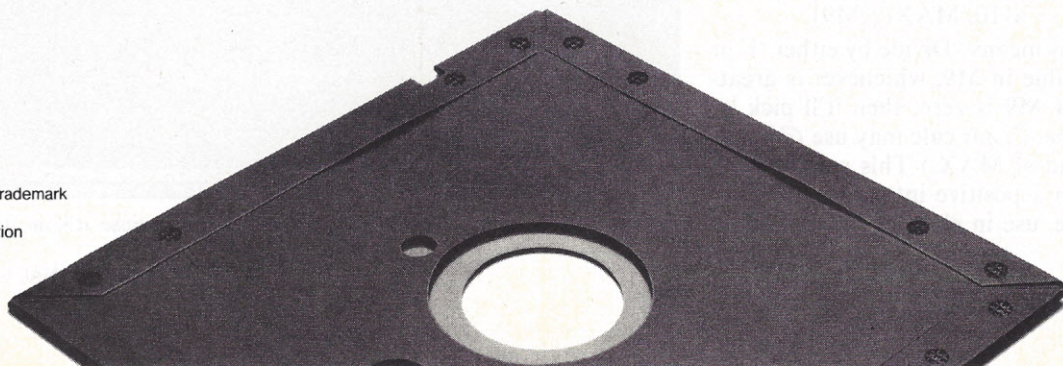
You can prove it to yourself. Just take a floppy and twist it.

See those wide open spaces?

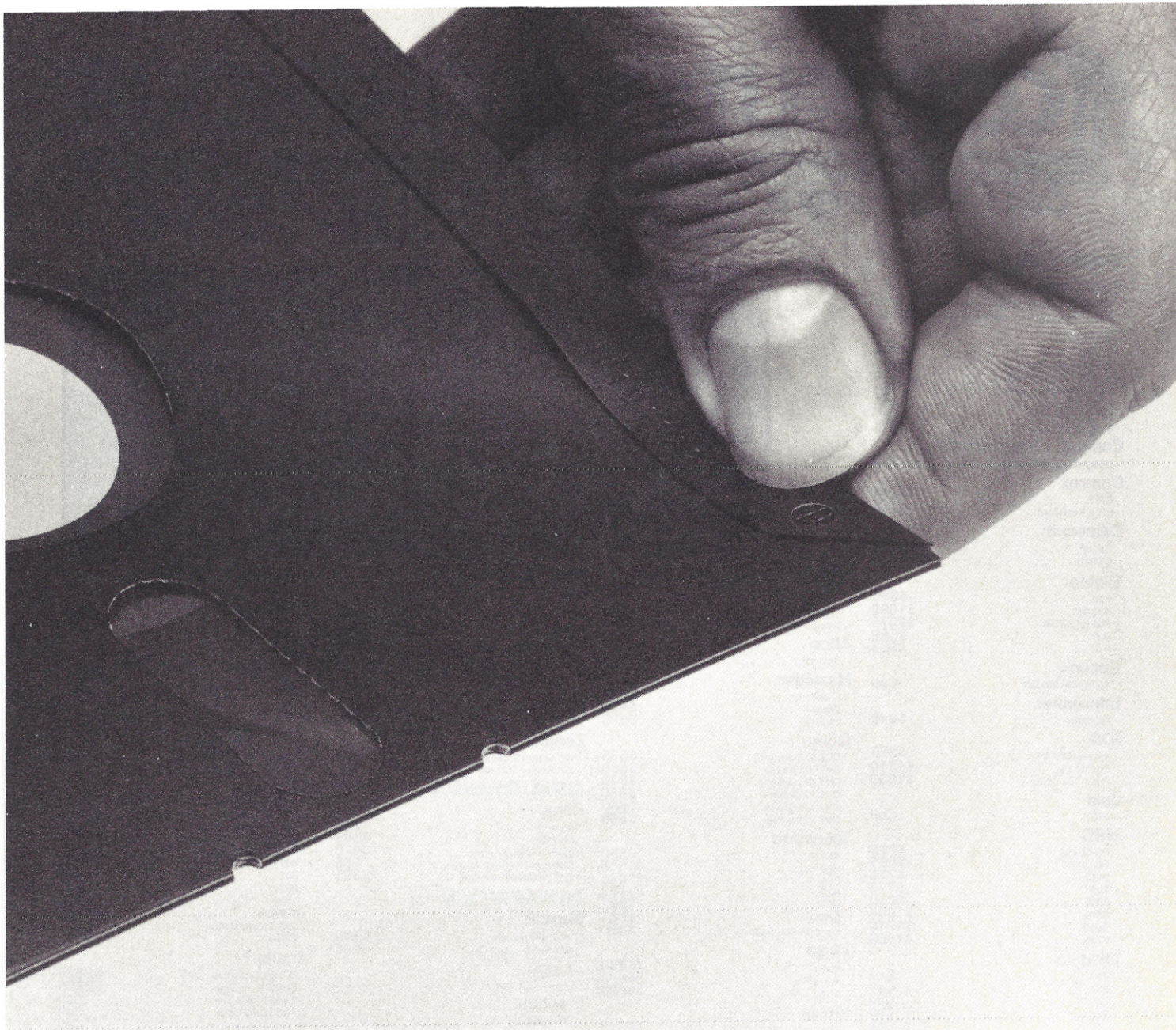
That's sloppy. And dangerous. Because if you put a sloppy floppy into your disc drive, it can jam the drive. Lose your data. Or ruin the drive head.

And there goes \$400.

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# ruin your \$400 disc drive.

## THE MEMOREX® SOLID-SEAM BONDED FLOPPY

Memorex seals its floppy discs with a process it developed, called Solid-Seam Bonding.

Solid-Seam Bonding seals shut every inch of every seam of every Memorex floppy disc. Tight as a drum. That makes the Memorex floppy stiffer. Stronger. And your data safer.

You can prove it yourself. Just take a Memorex floppy and twist it. You'll see no wide open spaces.

No wide open spaces that can jam your drive. Lose your data. Or ruin your drive head.

Which could cost you \$400.

So why risk it?

Protect your drive. And your data. Ask for Memorex floppy discs, with Solid-Seam Bonding.

It's always better to be safe than sloppy.

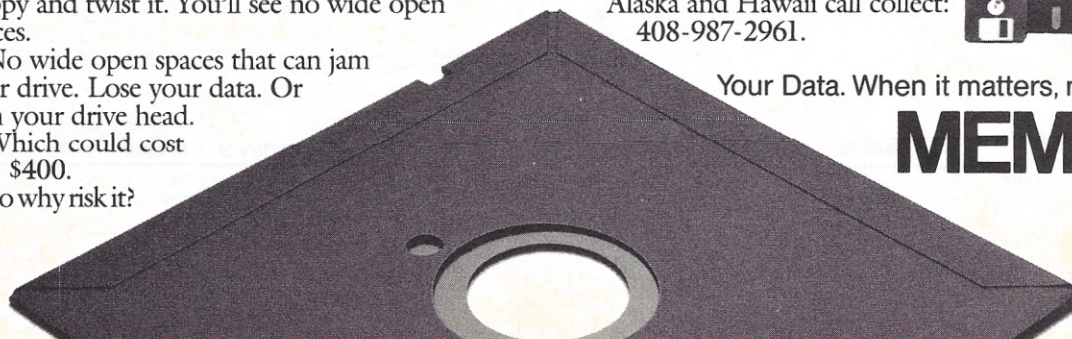
For more information on the full line of Memorex quality computer media products, including computer tape, call toll-free: 800-222-1150. In Alaska and Hawaii call collect: 408-987-2961.



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# MEMOREX

CIRCLE 22





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All Printer Models	Call
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1340	\$775

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• MS-DOS • Sanyo Basic

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All models	Call
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	Call
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803H	Call
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Z-150 Dual Drive	Call
Z-150 10 Megabyte	Call
Z-160 Single Drive	Call
Z-160 Dual Drive	Call

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By "flagging" values you can selectively recalculate parts of your spreadsheet.

## PERSONAL PRODUCTIVITY

(continued from page 139)

"absolute" references in Lotus 1-2-3 that throws most people. It's not really that complicated. "Relative" means that what the formula says depends on where it is. Add up the numbers in column B and it's column B you're interested in. Copy that formula to column C and you want the formula to change so it says "add up column C"; you don't want to add up column B again. It's all relative.

That's not so hard. It's absolute references that are a puzzle. Fortunately, they're rare. You might need it if you use one specific cell to store a factor that is used in many places around the spreadsheet; for example, an inflation factor assumption. Then any formula in the spreadsheet that needs an inflation factor refers to this *one specific* cell. To change the assumption for inflation in the whole projection, you only need to change that one cell's value. The key is that one cell is used by several other cells in the spreadsheet. Formulas referring to that cell are using an absolute reference.

The easy way to do it is to follow this rule of thumb: Always use "relative" until you get in trouble. Then change it to "absolute."

\*Flexible sums: If you're adding up a column of numbers, don't just "@SUM(D5..D10)," because if you try to insert a row to the beginning or end of that column (at D5 or D11), Sum won't adjust and you'll have to rewrite the formula. And if you delete row 5 or 11, Sum will go blank.

Instead, always include an extra empty row at the top and bottom of

such ranges: "@ SUM(D4..D11)." SUM ignores blank or text cells, so you can use those extra cells for underline separators. This lets you add or delete a row anywhere in the column and Sum will adjust without trouble.

\*One-shot recalc: In SuperCalc, to recalculate just *one* cell by itself, set recalculate to Manual, move the cursor to the cell, then /Edit the cell and put it back without changing anything (/E<CR> <CR>). SuperCalc will then recalculate just that cell without triggering a general recalculation.

\*Special functions: Some spreadsheet functions are so powerful, you might find them worth studying in more depth. Most programs have a Lookup or Choose function that lets the program examine your entry, then choose data from a list somewhere on the spreadsheet. Tables of

freight charges, variable sales commissions and graduating tax rates are three common uses for such functions. Lookup and Choose seem daunting to some people, but they're the same thing you see on your income tax brochure every year: two columns of numbers, one representing income, the other representing the appropriate tax.

If and its related "logical operators" are likewise overlooked because they start to look like programming. Indeed, if you know anything about BASIC, the If function will be very familiar. But the If family is very powerful: It lets your spreadsheet select from several possibilities and multiple-alternative formulas and can be nested. Here's a formidable-looking example: If selects a value from one of three Lookup tables, depending on the range of the value in A6: "IF(A6>100, LOOKUP (M50:M60), (IF(AND(A6<

	A	B	C
1	WHAT HAPPENS WHEN DIVIDING BY ZERO		
2	SUM(A4:A8)	SUM(B4:B8)	SUM(C3:C9)
3	Units Sold:	0	0
4	144.35	144.35	144.35
5	123.23	123.23	123.23
6	118.98	118.98	118.98
7	110.00	110.00	110.00
8	139.75	24.48	24.72
9	636.23	496.48	
10	Fixed Costs	2200.00	2420.00
11			
12	Include numbers only: ????	But include space above and be	
13	Trouble in Col. B when deleting	and edits are easy!	
14	the number at B8!		
15			
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100			

Text: SUM(C3:C9)  
Width: 15 Memory: 122 Last Col/Row: C15 ? for HELP  
F1 = Help; F2 = Erase Line/Return to Spreadsheet; F9 = Plot; F10 = View

When adding a column of numbers, include an extra space for easy editing.



# A printer should complement your computer, not compromise it.



It's a simple fact that your small computer can compute a lot faster than your printer can print. A problem that becomes even more frustrating in business, when your computer is tied up with your printer while you're ready to move on to other work.

Of course, the only thing more frustrating than waiting on a slow printer is waiting on a printer that's down. Unfortunately, chances are the initial printer you purchased with your computer system just isn't designed to work on continuous cycle high volume printing.

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Genicom 3000 PC printers feature switch selectable hardware, dual connectors and dual parallel or serial interfaces. Plus the 3014 and 3024 emulate popular protocols for both Epson MX with GRAFTRAX-PLUS™ and Okidata Microline 84 Step 2™, while the 3184, 3304 and 3404 emulate popular protocols for Epson MX with GRAFTRAX-PLUS™ and Diablo 630. So your current system is most likely already capable of working with these Genicom printers without modification.

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*You'll find a surprising number of easily modified templates right on your calc program disc.*

## PERSONAL PRODUCTIVITY

100,>50), LOOKUP(O50:O60), LOOKUP(Q50:Q60))". Looks horrifying, doesn't it? It's really not as bad as it seems.

It seems that creating formula shortcuts assumes that you have a taste for math. But it's possible to collect such tips without having a degree in calculus. Templates (pre-designed calc worksheets with the headings and formulas already entered) are a rich source of clever spread-

sheet work. Experts have set them up to maximize usefulness and minimize errors. As Patrick Neary, head of customer training for ComputerLand of Riverside, Calif., points out, you'll also find a surprising number of templates right on your calc program disk. The samples are meant to teach you how to use the program but many of them can be used just as they are with minor modifications. These free templates can be quite elaborate: loan analysis (Lotus), balance and tax sheets (Perfect Calc), engineering analysis (SuperCalc).

Some tips and tricks are just bright ideas and wisdom people collect along the way. Here are a few you might find useful.

**\*The expanding spreadsheet.** Here's a solution to the problems created when your spreadsheet grows: the Ladder Layout, as proposed by Christine Thompson, product manager for VisiOn-Calc at VisiCorp. If your spreadsheet contains several parts, adding rows and columns to one part may force you to push other sections of the spreadsheet aside. This makes it hard to find items for viewing or printing. To solve this

problem, don't put one spreadsheet section next to the other. Instead, place them catercorner to one another. The result is a spreadsheet that looks something like a ladder. Any "step" on the ladder is free to expand without pushing other sections aside. Now you have fixed coordinates for each section so you can quickly print or view any desired section.

feature called "hide" which causes the column to simply disappear until recalled. Steiner also puts printing instructions ("print copies: A1:D25 and 'All'") in such columns for his own convenience.

**\*Down with giants.** Much is made

of spreadsheet capacity, but how many casual spreadsheet users really need a 50,000-cell worksheet? It's a nightmare finding your way around a spreadsheet 200 columns wide by 500 rows long. Imagine how long recalculations take! You could make a mistake and never know it. Instead, break your project into manageable, self-contained sections, then learn how your program does consolidation so you can put the results into a summary file. Your macro function can be set up to perform the consolidation automatically.

**\*Print sideways.** Do you find your-

	A	B	C	D	E	F	G
1	ASSUMPTIONS STATED ON SPREADSHEET						
2	SUM(B4:B8)	SUM(B4:B8)	SUM(C3:C9)				
3		Assumptions	Jan	Feb	Mar	Apr	May
4	144.35	144.35	144.35	443.10	465.26	488.52	512.94
5	Units Sold:	+5%/MO.	422.00	443.10	465.26	488.52	512.94
6	Net Sales	+6%/MO.	14888.00	14849.00	15730.40	16674.22	17674.68
7	110.00	110.00	110.00	ERROR	ERROR	ERROR	ERROR
8	Income/Unit	24.48	33.18	33.49	33.81	34.13	34.46
9	COG Per Unit	+12%/MO.	24.48	24.72	24.97	25.22	25.47
10	Profit	ERROR	3669.44	3884.44	4112.83	4352.94	4607.96
11	Overhead	2200.00	2420.00	2662.00	2928.20	3221.02	3543.12
12		+12%/MO.	2200.00	2420.00	2662.00	2928.20	3221.02
13	Net Profit	ERROR	below	ERROR	ERROR	ERROR	ERROR
14			1469.44	1464.44	1450.83	1424.74	1386.94
15							
16							
17							
18							
19							
20							

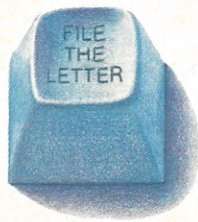
\* A1 Text: ASSUMPTIONS STATED ON SPREADSHEET  
Width: 14 Memory: 121 Last Col/Row: F14 ? for HELP  
F1 = Help; F2 = Erase Line/Return to Spreadsheet; F9 = Plot; F10 = View

An inappropriate entry can result in an ugly display of ERROR messages.



# Before the personal computer, you could file a document, design a form, write a memo and produce a report without reading a single 200-page manual.

## You still can.



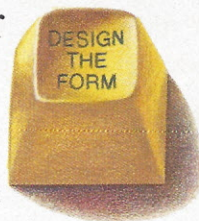
Yes, it's true.

Personal computing has finally gotten us back to where we started. Doing simple things simply. Without having to relearn a single skill. Or read another manual.

Which means that filing a letter is, once again, as easy as filing a letter. And getting forms, memos and reports is just as simple.



All thanks to **Offix**, the personal office system that puts a true end to "manual labor."



If you need to file a document, **Offix** tells you how. With pop-up menus, help screens and plain English sentences. No manuals. Just step-by-step help. **Offix** does the same for word processing, forms design and report generation. All easy. And all for just \$149. See **Offix** at your local retailer. Or call us at 800/782-4896. So you can stop reading. And start doing.



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\*Requirements: MS-DOS, 192K RAM, two disk drives (minimum 320K each). Runs on IBM PC and IBM XT (and most compatible machines), TI PC, NEC APC, DEC Rainbow, Zenith Z-100, Victor 9000, Tandy 2000 and the HP-150.

CIRCLE 18



*You can make your project more manageable by consolidating it in self-contained sections.*

## PERSONAL PRODUCTIVITY

self taping printouts together because your spreadsheet is too wide for your printer paper? You can buy a wider printer or learn how to make your printer do 15 characters per inch (compressed mode), which gives you 132 characters on an 8½" page.

But that still might not be wide enough. So investigate a program called Sideways (produced by Funk Software, Cambridge, Mass.) which will make your Epson, Okidata, Prism or ProWriter dot-matrix printer do its printing sideways. That is, rotated 90 degrees and running down the page the long way, for as many pages as necessary. It's good for schedules and PERTcharts too.

\*Easy labeling. In SuperCalc, cell A1 has special significance: Whatever you put there appears as the File Summary when you ask for a "Disk Directory, SuperCalc Files Only." Use cell A1 to describe the spreadsheet so you can pick through a diskful easily. This saves jotting things down on little slips of paper or loading file after file to find the one you want.

\*Go where the action is. Instead of searching in vain for a spreadsheet program that does fancy print formatting or extended data base management, try using the power of other programs to support your spreadsheets. Need underlining, boldface, italics, parentheses, commas and other niceties on your final printout? Nothing beats a full-feature word processor. Some calc programs, like VisiCalc and Perfect Calc, keep disk files that can be read by your word processor. Others can produce read-

able disk files for your word processor (look in your calc manual for details). The word processor can prepare the spreadsheet for final printing, adding all the necessary print formatting and even run the spelling program to check your labels. Or incorporate parts of the spreadsheet into a memo or report. You can also add page numbers, headings and footnotes.

Most calc programs can interact with many other programs as well: You can extract data from your data base manager, for instance, and use it in the simpler file managers found in advanced spreadsheet programs. You can trade data with a BASIC or Pascal program or even with another brand of calc program (VisiCalc, SuperCalc and Lotus have the ability to trade files).

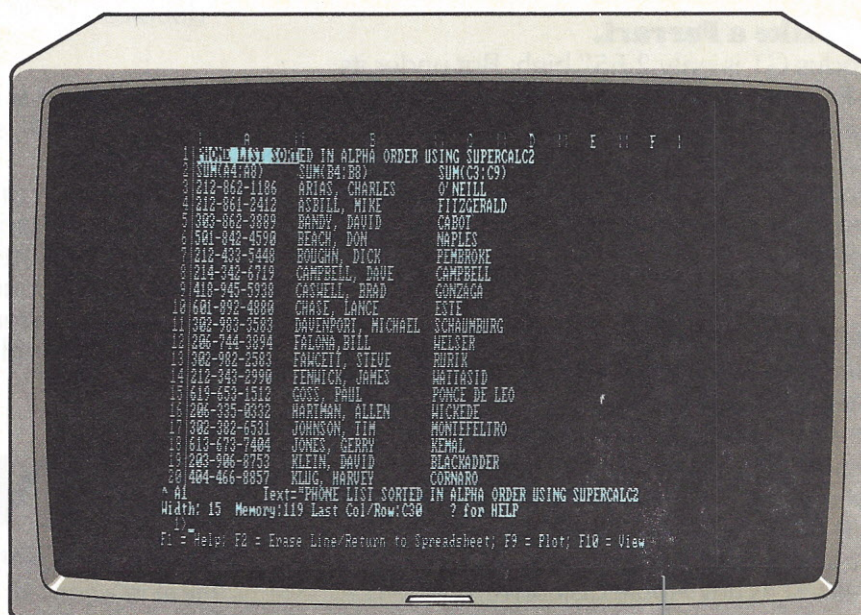
A spreadsheet user is always looking for new applications. Spreadsheets are good for doing math, of

course, but did you ever think of using them as a substitute for a BASIC program? Stan Trost, author of *Doing Business with 1-2-3*, says he can't think of a short BASIC routine that can't be done easier with a calc program.

With built-in or add-on graphics, spreadsheets are also great for statistical studies. Why pay an artist for charts needed in a manuscript when you can tinker with your spreadsheet graphics until it's just the way you want it?

Writers find spreadsheet programs handy for tables, which are the weak point of many word processing programs: They just don't handle column material very easily. But they're a breeze even for the simplest spreadsheet program and you can then copy the material into your word processing file.

Most second generation calc programs offer sorting: You can sort a



A calc program can be used to maintain a list of items such as telephone numbers.



# Looks like a Ferrari. Drives like a Rolls. Parks like a Beetle.



Ask your computer dealer  
to take the cover off a world-class disk drive.

The all new, 1984 Indus GT.™

The most advanced, most handsome disk  
drive in the world.

A flick of its power switch can turn an Atari  
into a Ferrari.

Or an Apple into a Red Hot Apple.

## **Looks like a Ferrari.**

The Indus GT is only 2.65" high. But under its  
front-loading front end is slimline engineering  
with a distinctive European-Gran flair.

Touch its LED-lit CommandPost™ function  
control AccuTouch™ buttons. Marvel at how  
responsive it makes every Atari or Apple home  
computer.

## **Drives like a Rolls.**

Nestled into its soundproofed chassis is the  
quietest and most powerful disk drive power sys-  
tem money can buy. At top speed, it's virtually  
unhearable. Whisper quiet.

Flat out, the GT will drive your Atari track-to-  
track 0-39 in less than one second. Increasing  
data transfer 400%. (Faster than any other drive.  
And as fast as any Apple disk drive.)

And each GT comes with the exclusive  
GT DrivingSystem™ of software programs.\*  
World-class word processing is a breeze with  
the GT Estate WordProcessor.™ And your dealer  
will describe the two additional programs that  
allow GT owners to accelerate their computer  
driving skills. \*Included as standard equipment.

Also, the 1984 Indus GT is covered with the  
GT PortaCase.™ A stylish case that conveniently  
doubles as a 80-disk storage file.

## **Parks like a Beetle.**

The GT's small, sleek, condensed size makes it  
easy to park.

And its low price makes it easy to buy.  
\$449 for Atari. \$329 for Apple.

So see and test drive the incredible new 1984  
Indus GT at your nearest  
computer dealer soon.

The drive will be  
well worth it.



# INDUS™

**The all-new 1984 Indus GT Disk Drive.**

*The most advanced, most handsome disk drive in the world.*

For dealer information, call 1-800-33-INDUS. In California, 1-800-54-INDUS, 213/882-9600.

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*Some calc programs can interact with other programs such as word processors or data base managers.*

## PERSONAL PRODUCTIVITY

list by column. Imagine the possibilities—lists of inventory, membership rolls, authors, books, accounts, words, topics, or a cross-index of two or more columns can be put on a spreadsheet, then sorted by different categories. You can generate schedules, rates, price lists and indexes.

\*Anything repetitive is grist for your calc's mill because it's so easy to copy. One example is the mailing list. You can keep a short mailing list of a group on your calc sheet, printing the results on mailing labels. (This is best if the group has little turnover; otherwise it's probably worthwhile to consider a filing program.) It's even better if your mailing list has a lot of repetition. For example, you can run off dozens of return address labels in minutes using your calc and its Copy command to reproduce the address down the column or even three-across for sheet mailing labels. Or you can keep a mailing list of the entire U.S. Senate, since the addresses are all the same and only the names change.

### Learning more

If you are intrigued by the potential of these powerful, flexible programs, there are ways to learn more.


\**Software Arts Technical Notes (SATN)* is a bimonthly publication produced by Software Arts, the inventors of VisiCalc. It specializes in VisiCalc, but most of it is useful with other calcs, too. This isn't a house organ with simple kid's stuff. *SATN* is full of advanced financial and sophisticated mathematical applications. Subscriptions are \$30.00 per year (\$50.00 for two years) and is available from: SATN Subscriptions, P.O. Box 815, Quincy MA 02169.

\*The InterCalc Users Group, P.O. Box 254, Scarsdale, NY 10583 is for all those interested in calc applications. It publishes a periodical containing news and tips.

\*Many of the major spreadsheet makers publish their own newsletters. Sorcim, for example, has *SuperNews*, with tips for SuperCalc users

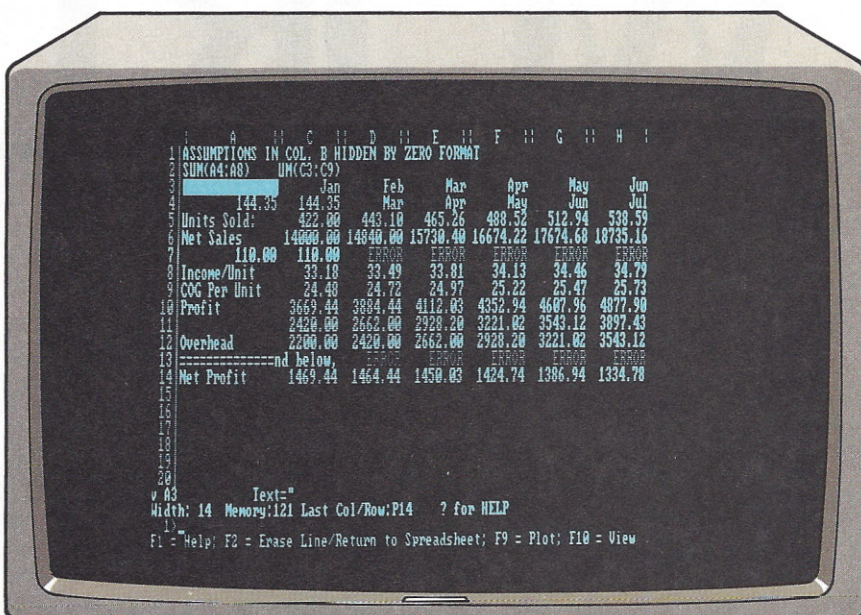
and is distributed to registered owners. Your calc maker may have something similar.

\*Local computer users groups also have calc sections whose members can be helpful. Ask your computer store for a user group for the computer brand you own or a related brand

(IBM-compatible owners can join IBM groups, Morrow and Osborne and Kaypro owners can join one another's groups). Also look for user groups based on specific brands of software or types of software (like the InterCalc group and the Lotus user group). 

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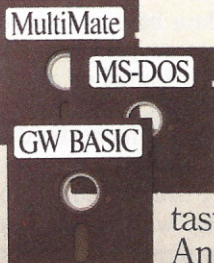
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# How Hard Disks Can Save You Time As Well As Space

Massive storage capacity is only one of the benefits of using hard disks. They can also speed processing and make file management easier

by Robert A. Sehr, Associate Editor

While personal computer users enjoy having the space of at least 100 floppy disks within a single drive, they are equally appreciative of the Winchester's time savings. For the personal computer user, life with a Winchester begins with the drive's quick access to programs at a keystroke and doesn't end with its faster processing of data files. There is the additional element of comfort and ease of use that can't be matched by floppy disks.

"Floppy disks are a pain," says Michael D. Winton, owner of M.D. Winton Distributing and Anabolic Laboratories in Santa Clara, Calif., and a new convert to Winchester disk systems. "The idea of getting a computer in the first place was to get the work done faster and it just seemed like the floppy disk was a step backward. The promise of speedier processing, however, did far more to win him over than the promise of additional disk storage.

For many people simple storage capacity is worth the investment. But for an increasing number of serious personal computer users, the Winchester disk drive's other benefits are more important. The ability to store several different programs or data files on disk and have them all a few

keystrokes away amplifies their computer's power.

Says Charles Bornheim, a San Francisco computer consultant, "There are three important reasons for buying a hard disk system. First there is the need for large storage capacity, then the need for faster disk

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*It's likely that  
future programs  
will demand  
the capacity of  
hard disks.*

---

access, and finally the convenience of not having to juggle floppy disks."

#### *Defining needs*

Users must decide if data storage or speed are critical to their application, Bornheim warns. The worst thing anyone can do is buy something that will end up in the closet. "You buy gear because you use it," says Bornheim, "you don't use gear because you buy it."

If all you need to do is simple word processing, without a large interactive data base, speed and storage capacity may not be of much use to you. If on the other hand, you must generate 1000 form letters a week, the speed of a Winchester may be important enough to justify the investment.

To demonstrate the power of a Winchester in using a program, take the example of using one of the current generation of integrated software programs which include word processor, data base and spreadsheet within the same package. The programs are distributed on several floppies, each of which must be loaded as needed. With a Winchester disk, they need to be loaded only once (assuming they are not copy protected, something we will go into later) and the entire program can then be called up with a keystroke, rather than flipping through floppy disks.

In a disk-based word processor such as MicroPro International's WordStar, frequent accessing of the disk is accomplished much faster. In floppy disk form, WordStar can take a long time to perform search and replace or paragraph move functions because of the amount of time it takes to go from one disk to the other.



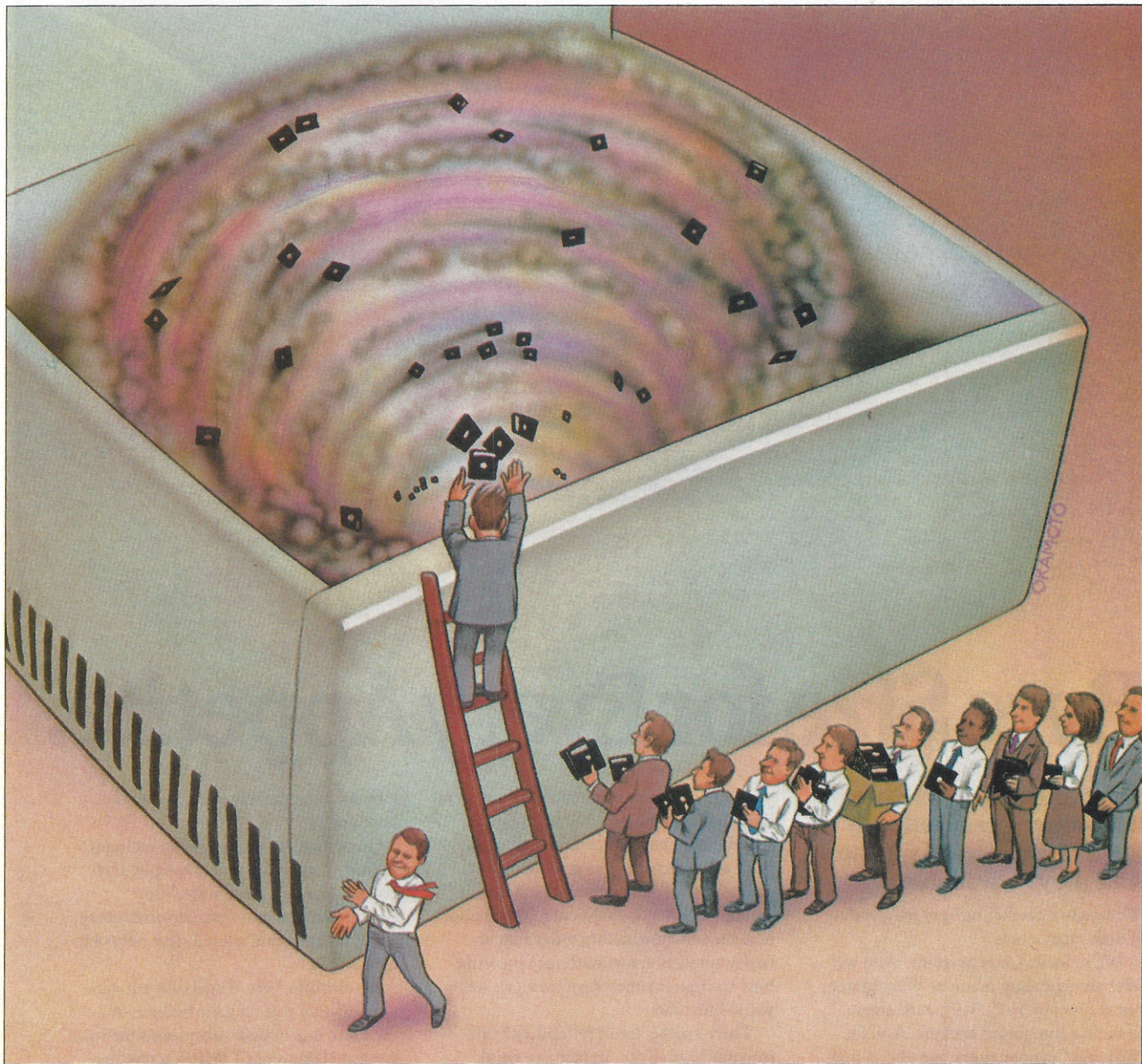


Illustration by Michael Okamoto

With the faster access time of a Winchester, a long file can be processed in seconds.

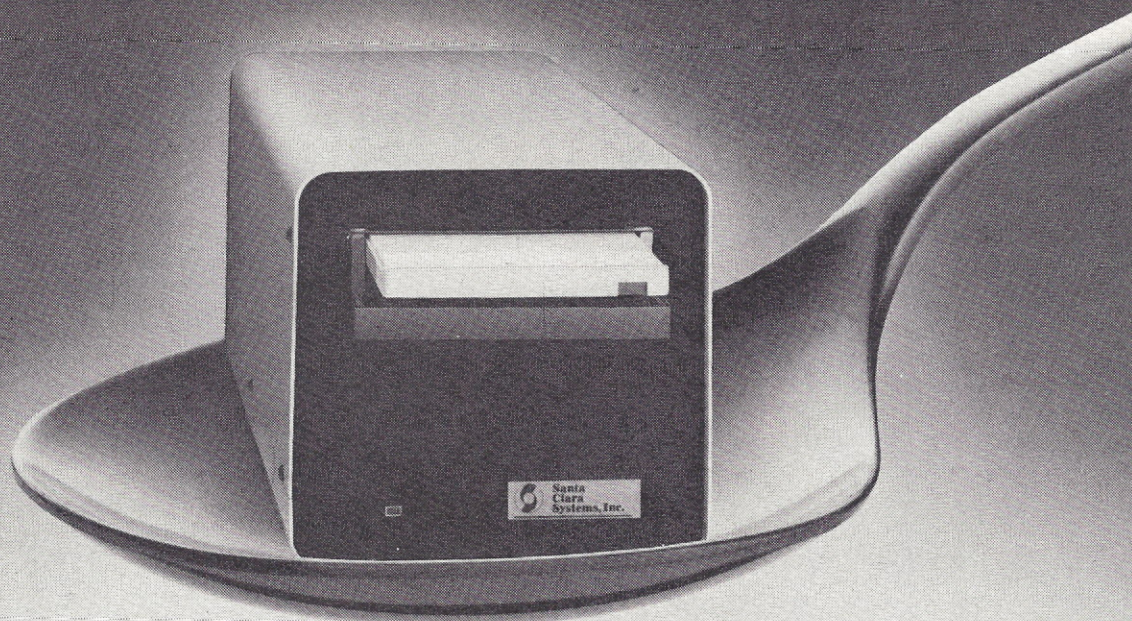
Data files can also impede speed on a floppy disk. One of the most common causes of data loss with floppy disk systems is the physical mishandling of diskettes. In a Winchester disk system, data files are organized into a set pattern of directories stemming from the root. There is no need to spend time searching for

a particular diskette that contains valuable data. By organizing files into the various directories, according to common characteristics like command files, word processing files, and spreadsheet files, the user can ensure that files will always be within the reach of a keystroke.

It is increasingly likely that serious business programs of the future will almost demand the speed and storage capacity of a Winchester disk drive

system. As more and more programs are sold on multiple 5¼" floppy diskettes, the human tolerance factor for switching disks will diminish, precluding the use of anything less than a Winchester. Converts to Winchesters claim that man was not designed to juggle floppy diskettes. "You almost have to have a robot arm to wrestle with floppies," says John Kidder, controller of Amfac Amycel, a distributor of mushroom





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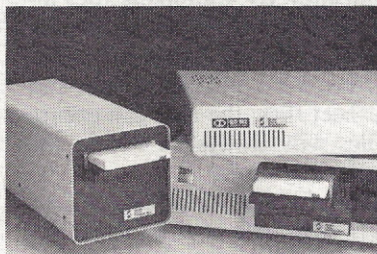
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### ***Programs get bigger***

The trend toward ever larger programs like Lotus 1-2-3, Ashton-Tate's Framework and Apple Computer's Applesworks which take up several 5  $\frac{1}{4}$ " floppies is accelerating. All may well challenge the user to make the choice between juggling floppy diskettes or using a Winchester. In addition, operating systems—especially with the recent trend towards windowing—are getting larger and as a result require more and more diskette juggling in order to load them.

Business graphics packages now in the works require not only greater RAM, but additional disk storage space and are likely to further diminish the role of floppy-based systems as serious business computers. "Can you imagine anyone trying to load these kinds of programs 320k at a time?" asks Dick Van Lear, president of the ComputerLand retail store in Fremont, California.

Ultimately, say some forecasters, the Unix operating system is likely to become the standard on personal computers and because of the massive storage needed to hold Unix, will require a Winchester disk. Already some personal computers—including some newly introduced high-end IBM models—are using Unix and all of them are sold with Winchester disks. AT&T, which recently announced its entry into the minicomputer market, is basing its strategy on creating a new market that will revolve around the Unix operating system.

Along with these known benefits, there are some unexpected rewards that come from a Winchester disk system. "I discovered uses for my personal computer that I never dreamed of before," notes Jim Porter, market researcher and author of *DiskTrend Report*, an industry guide to floppy and hard disk drives. "There is just no

other alternative to using a hard disk for any serious user of a data base."

Surprisingly, Porter is a recent convert to the use of a Winchester-based system. As marketing director at Memorex 20 years ago, Porter was involved in the development of magnetic storage media and he has followed the evolution of the Winchester drive since IBM first sealed a head/disk assembly into a cabinet, added a power supply and some electronics and revolutionized the indus-

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***"There is just  
no other  
alternative to  
using a hard disk  
for serious  
data base users."***

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try in 1973. More recently it has been Porter's job to track the performance of the world's manufacturers of both floppy and rigid disk drives.

Porter's needs involve bar graph and pie charts for client presentations and to include in his newsletters. He was faced with the choice of continuing to pay an outside computer service bureau to put the reports together for him, or switching to his own Winchester disk-based system. He switched.

### ***Breeder reaction***

Porter, unlike most personal computer users, began with a 20Mbyte drive, believing 10Mbytes would not be sufficient for his rapidly expanding business. He has already exhausted the 10Mbytes common in most systems and says he is able to keep sufficient disk space available by archiving infrequently used files on backup tape cartridges. He also purges unnecessary files in regular housekeeping sessions twice a month. Porter says that

without these procedures he would soon exhaust his available 20Mbytes.

Other users report similar experiences. "It's like a growth from outer space that is constantly breeding," says James Haner, executive director of the Microcomputer Management Association and owner of Dynamic Computer Services in Palmdale, Calif. "Once you get a hard disk you create needs for it. You say to yourself, 'Wouldn't it be neat if we had a record of this or this!'"

Before you know it, you have not only justified the cost of the Winchester disk drive by finding more uses for the computer, but you have created a need for the extra storage space.

"I have to wait in line sometimes to use the IBM Personal Computers (with Winchester disks)," says John Kidder, whose office maintains a network of three IBM Personal Computers and a second network with two compatibles.

The general perception of Winchester disk owners is that their ease of use also helps destroy the fear within first-time computer users. Being able to recall files at a keystroke can ease the tensions of a new user who might otherwise be turned off.

By now, most clerical workers have probably accepted the inevitability of working with a computer of some sort. However, office temps who go from office to office are not likely to have the patience to take on what may seem like an imposing challenge. In this situation, the Winchester can act as a simple repackaging device. "When you present someone with a software program on five floppy disks the usual reaction is 'gee—I have to learn all of that?'" says ComputerLand's Van Lear. "When that program is completely resident within a hard disk, it doesn't seem as tough."

### ***XT tops old mainframe***

Ralph G. Campbell, general manager of Chapel of the Chimes in San



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Francisco, notes another benefit of today's Winchester technology. According to Campbell, the hard disk beats even a mainframe. Campbell recently acquired a 10Mbyte IBM XT to help run his chain of four Bay Area mortuaries and cemeteries—a job that was handled by a small mainframe 15 years ago. "We gave up the mainframe because we were just too small to afford it—we have less than 100 employees—and turned our data processing over to a service," Campbell says. "Now we can do our daily reports on a network of XTs and do electronic mail as well."

How does a Winchester drive achieve this performance? Winchester disk drives operate on the same magnetic recording principles as floppy diskettes—with one important difference. A Winchester disk contains a head/disk assembly that operates in a sealed environment that keeps out things like dirt particles, hair and other foreign objects and allows the read/write head to fly within microinches of the disk. This means data can be stored at higher densities than on floppies and it can be read much faster. The rotational speed of floppies is limited by the pressure caused by the head touching the disk. A Winchester, on the other hand, is constructed in such a way as to keep the head off the disk, allowing it to spin at 10 times the speed of a floppy without losing data.

In order to allow it to move at this microscopic distance above the disk, the head is carried on a small arm. As the disk spins, friction between the disk surface and the air around it drags the air along with the disk. The air passing over the arm on which the head is mounted causes an aerodynamic lift, making the head actually fly over the disk. Because the environment is sealed and dust-free, the head can fly at a close distance and read data that is packed at greater densities than on a floppy.

As a result, the Winchester disk can store data that once required a

14", cabinet-mounted drive within the space taken up by a 5¼" floppy diskette. For most personal computer applications, the average 10Mbyte hard disk is enough. Even if it isn't, there are means available to double and even quadruple that capacity. A single controller can handle up to four hard disks, bringing down the cost of subsequent storage devices. (The controller acts like a traffic cop between the disks and the CPU.) As a result, even though

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*Ultimately, the  
Unix system,  
with its massive  
storage needs,  
is likely to become  
the standard.*

---

floppy disk drives cost a fraction of the price of a hard disk per megabyte measure, the Winchester has the cost advantage. Indeed, the cost per megabyte has been dropping rapidly in the past two years as competition increases among hard disk manufacturers.

In addition to its relatively expensive price, a Winchester system does have drawbacks. First of all, a Winchester disk drive remains a permanent part of your system. It can't be removed. In the event of a disk failure, there is the possibility of a complete loss of all data files—unless they are backed up on a regular basis. "Losing 100 files on a Winchester can be a lot more painful than losing a couple of files on a bad floppy," says consultant Haner.

You have to be prepared to not only spend extra time, but in certain cases, extra money on equipment to back up your files, says Larry Shergallis, co-owner of Joyce Designs in San Jose, California. "Backing up

files is the most critical thing you can do with a Winchester." Shergallis knows of what he speaks: His faith in the reliability of his Winchester drive has been shaken on more than one occasion and he has learned from the experience. Each night before he closes the books on the sports uniform design business that he operates out of his home, he makes sure that every important file is backed up on a floppy disk, a process that can be as tedious as it is vital. For Shergallis, it takes almost an hour to back up a day's work on floppy disks. But he is emphatic when asked whether the extra time and expense give him second thoughts about the value of a Winchester and make him think about returning to a floppy-based storage system.

"Never," Shergallis answers without hesitation.

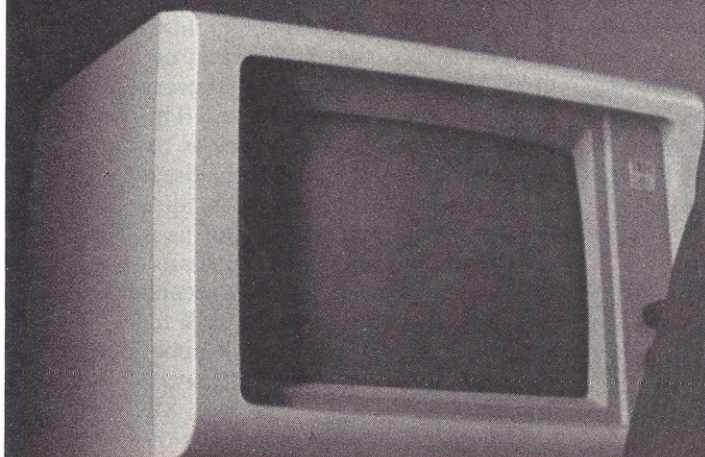
Amfac Amycel's Kidder points out that despite the time-consuming backup process, Winchester disks are much more reliable and therefore backup is not needed as much as on a floppy. In fact, backing up floppies, he adds, can be a learning experience for the potential Winchester user. "We're used to the concept of floppy disk deterioration. Consequently, we didn't have to be forced into learning backup procedures," he notes.

### ***Copy protection hassle***

The second drawback in using Winchester disks arises from the efforts of some software companies to protect against piracy. Many software programs have copy protection devices which prevent their being copied onto a Winchester disk—unless the user happens to be a technical genius who can get around the imbedded devices. As a result, you should review the software you intend to use on a Winchester. Kidder notes that although Lotus 1-2-3 can be loaded onto a hard disk, the system disk must be inserted in a floppy drive at all times in order to run on the hard disk. Some word processing



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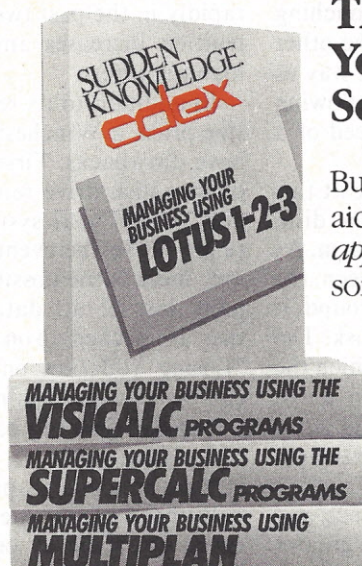
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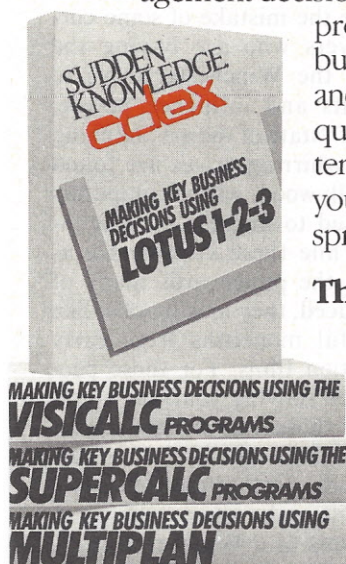
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software he has tried will not copy onto the Winchester at all.

"This is a terribly imprudent action on the part of the software companies," says analyst Porter. "It is getting to the point where more and more serious users will be using hard drives with their personal computers. What serious business software company would lock out hard drive users?"

What software developers put together though, true hackers often tear asunder, notes Manny Lucero, sales manager for ACP Technology Center in San Jose, and host of a Silicon Valley computer talk show called *PC Hotline*. Lucero says these techniques range from the complicated "half-tracking" which involves detecting sector patterns in the software locking scheme, to the simple loading of a program into RAM and then on to the hard disk. Manufacturers are fighting back with more sophisticated schemes, but few are impenetrable. "It's becoming a challenge for hackers," Lucero says.

Despite this ongoing battle, it is clear that software companies will eventually find a compromise between copyprotecting their programs and allowing transfer to a hard disk. Like every other development in the industry, the market will follow user demands.

Having considered the benefits and the drawbacks of using Winchester disks you are now ready to decide if you should plunk down a sizable hunk of cash. But despite the benefits and the drawbacks of Winchester disks, the question of their value persists.

Mass storage is but one advantage of the Winchester drive. Others are speed in processing programs, in accessing data files and even in learning how to use the computer itself.

Personal computers can be a threat to inexperienced office workers who must often struggle with the mystery of learning a new tool. Add to this the hassle of playing "switch that floppy"

and stress levels rise. Although the initial confrontation with a Winchester—equipped personal computer may still be stressful, once the new user has mastered the system, the initial hostilities are not rekindled every time he must change a disk.

Those who hold the purse strings for your Winchester drive purchase may also question the benefit of giving a Winchester drive to someone who uses his computer for only brief periods each day.

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*You can buy 50  
Winchesters today  
for the price of the  
one IBM introduced  
10 years ago.*

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"Just getting more use of the computer represents 1960s-style thinking," answers consultant Haner. "Back then it was hard to justify the cost of a mainframe unless it was constantly in use. Today, someone might use a computer for 10 minutes a week and still save the company \$30,000. That certainly will pay for the computer."

Indeed, if the project at hand involved financial forecasting for a company, a Winchester disk, an integrated data base and spreadsheet with a graphics program could detect in minutes what might have taken months of paperwork to discover. Considering that timeliness may save thousands of dollars, the Winchester could pay for itself in one afternoon.

With today's technology, the reliability of hard disks contrasts sharply with the 14" monster drives that had to sit in an air-conditioned room. Today's Winchesters are quieter, smaller and transportable. Even with all of these advantages, you can buy


about 50 of today's Winchesters for the price of the one IBM first introduced 10 years ago.

However, Bornheim cautions, don't make the mistake of some corporate buyers who are buying the "sizzle" of the Winchester drive to make points and influence people. The days of "state of the art" blinking lights and whirring drives are found only in Hollywood, where computers are still used to impress the less informed. While these systems are as modern as the punchcards many of them produced, they look macho, like the powerful monoliths from early science-fiction films. For those people intent on reliving youthful fantasies, or for those who believe that a Winchester drive will turn their personal computer into a majestic marvel that will make them look good, the usefulness of a Winchester drive is questionable.

### *The Winchester image*

Nevertheless, as Bornheim notes, some users buy Winchester drives for the image. "Middle managers don't seem to care," he says, "it's not their money being invested."

In the main, today's personal computers are bought for a specific purpose by sophisticated users who care more about the product than the technology that makes their work possible. Most consumers do not buy a Cuisinart because of the rotational speed of the blades or the RPM of the motor. They buy it because it makes kitchen duties easier. The same can be said for the Winchester drive.

The Winchester drive, like the personal computer itself, is a serious business tool. It is not required in every application, in fact few of today's users absolutely require it. However, having it available gives the user a certain edge. Says user Shergallis: "With the added convenience, speed and capacity, a hard disk puts your computer in a business class—you can't mistake it for a game machine." 



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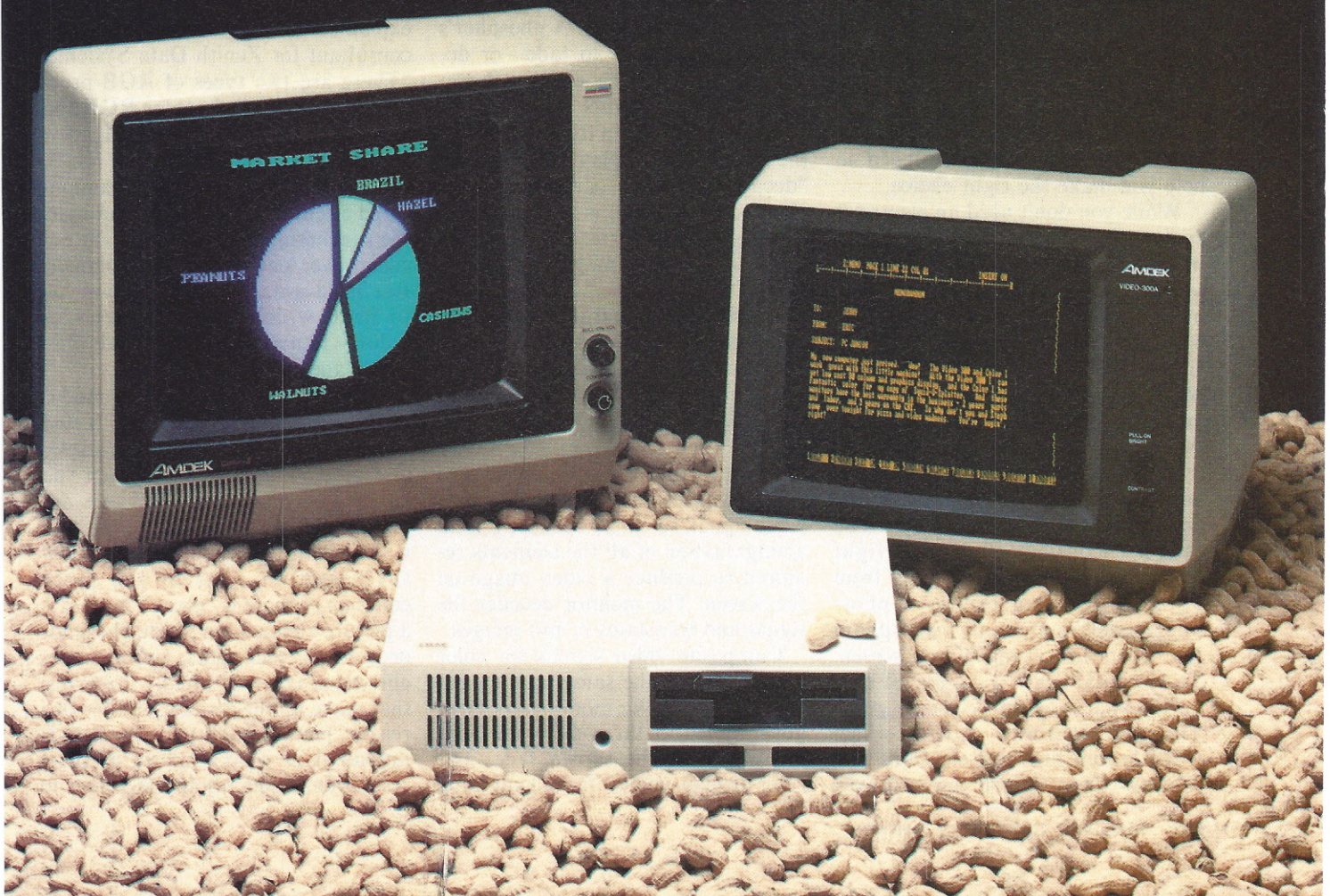
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# A Complete Buyer's Guide To Monitors

What you see is what you get, but don't overlook  
specific applications

*by Lynn Walker, Assistant Editor*

If you're in the market for a monitor, join the club. In 1983, 1.8 to 2 million video monitors were sold in the United States; that number is expected to reach 3 million this year. And like anything else in the personal computing field, the choices for the consumer are many—so many, in fact, that the prospective buyer may be overwhelmed. This guide is intended to give you an overview of the features available in monitors. The accompanying tables provide brand and model comparisons designed to help you make the right choice.

While you don't need an electrical engineering degree to pick a good monitor, it makes sense to have some understanding of the technology that makes monitors work. A basic knowledge of the terms and principles involved will make it easier for you to compare the various brands on the market, and to follow the comparison tables.

A video display—the letters, numbers or graphics characters on the screen of a cathode ray tube (CRT)—consists of dots of light formed when electrical energy from an electron beam excites a phosphorescent compound (phosphor) that coats the inside of the screen. The electron beam is generated by a device known as an “electron gun.” The gun contains a cathode which when heated liberates electrons and “shoots” them toward the positively

charged face of the screen. As the electron beam strikes the phosphors, the energy of the collision is transferred to them, creating a dot of light on the screen.

The phosphors are hit intermittently, though in a regular pattern, by the electron beam, so the light from them is not continuous. A phosphor's luminescence starts to fade—or decay—as soon as the electron beam moves on; it relights when struck again by the beam in its sweep across the screen. The display flickers if the “decay rate” of a particular phosphorescent material is too rapid.

In its simplest form, a monitor displays single-color images, hence the name “monochrome.” Monochrome monitors display characters in white, green or amber on a black or green background. The colors are determined by the chemistry of the phosphorescent coating on the face of the screen.

Most monochrome monitors accept what is known as a composite video signal, so-called because it is an amalgamation of all the elements required to produce a video image on the screen. The monitor decodes the signal and translates it into images.

Composite video signals for color monitors work the same way, except the CRT in a color monitor has three guns, aimed at three different color phosphors on the screen face. The color display comes from combining

the three color phosphors, whose intensity is varied by the strength of the electron beams fired by the guns.

That's how a composite video system works. Another color system, known as RGB (red, green and blue) makes use of picture signals that come to the monitor separately. As explained by Dave Green, technical consultant for Zenith Data Systems, “There are two types of RGB processing. One is called analog RGB and the other digital (or TTL, for transistor-transistor logic) RGB. Analog involves much more complicated circuitry, because, for example, the synchronization pulse may be encoded over one of the color signals. But its advantage is that it allows you to have widely varying levels of color—hence monitors with 256 colors and more.”

While this technical background is nice to have, you probably won't find yourself enmeshed in the intricacies of digital vs. analog RGB when you go to buy your monitor. There are however, some technical terms you will encounter as you begin to narrow the selection. One of the more common of these is “pixel.” A pixel is a picture element—a single phosphor or group of phosphors, either monochrome or color. It's really the pixels that make up the display, and for this reason, picture quality in monitors is measured in what's known as pixel resolution. Pixel resolution refers to



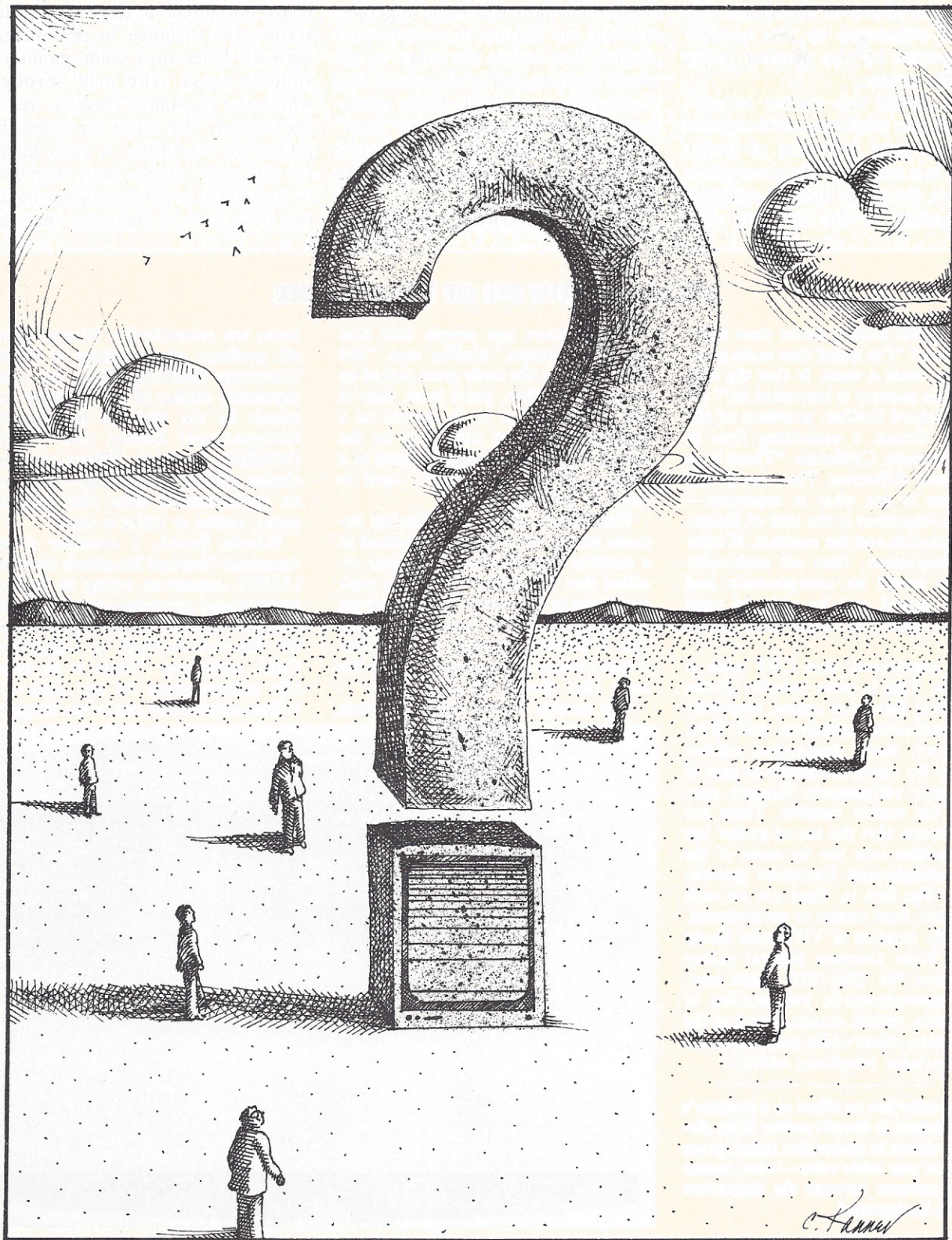


Illustration by Catherine Kanner



the number of dots on the screen. The total is expressed as the number going across by the number going down the screen.

Why should this matter to you? Actually, the pixel resolution number can be a good indicator of image quality in a monitor. The more pixels there are, the closer the dots will be to one another. If the dots are very

close, their light will blend together, creating the illusion of a continuous picture. This makes the image on the screen sharper, and in the case of text display, more readable. Some manufacturers express resolution in "lines" rather than pixels, but the principle remains—the higher the number, the better the picture.

Another way to measure resolution

is by dot pitch, a term which describes the distance in millimeters between holes in a color monitor's shadow mask (the grid through which the phosphors travel to reach the screen). The closer the holes, the higher the resolution. A color monitor with a dot pitch of more than 0.43 is considered a low-resolution monitor; 0.43 to 0.31 indicates that the

### STRAIN IS IN THE EYE OF THE BEHOLDER

Is an amber display better than white or green? "I'm asked that same question five times a week. Is that the only thing this country is interested in?" replies Richard Koffler, president of the Koffler Group, a consulting firm in Santa Monica, California. "There is no ergonomic difference. The color of the phosphor is not what is important—what is important is the lack of flicker, the resolution and the contrast. If color were important, then all multicolor screens would be unergonomic and people would not be able to read them... and you know that is not true."

The controversy over CRT color is not new. Talk in some industry circles has it that European unions, especially in Scandinavian countries and West Germany, have demanded amber displays for years, ostensibly as part of ergonomic refinements thought necessary for worker comfort. There are even reports that the use of amber has been written into law by some of the more enlightened European governments. The fact is, there are no such mandates, from unions or governments. The only mention of VDT color shows up in West German federal safety regulation No. ZH1/618 which says: "For monochromatic presentation of characters, yellow, orange, green, or the achromatic colors white, grey, black are *recommended* (emphasis added)."

**Screen color has no effect on a monitor's performance. It doesn't matter if the display is shown in amber (far right), green (right) or any other color—what counts is the contrast between the characters and the background.**

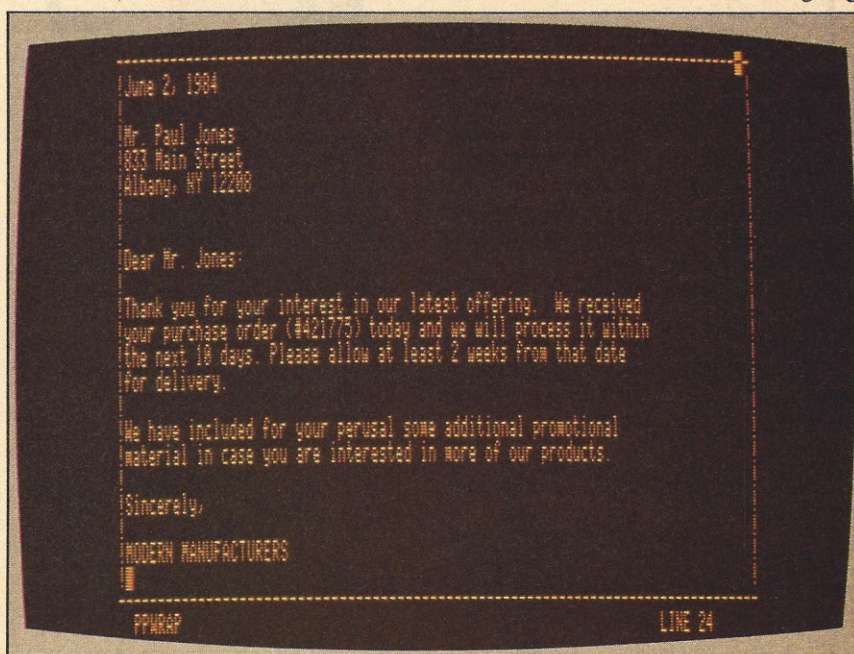
"Some years ago people said that amber was better," Koffler says. "But that's because the trade press picked up on the idea. Now, years later, they're still writing about it. It started as a hypothesis that got picked up by the wrong people and was perpetuated as a truism—and myths are very hard to break in this industry."

How did the idea start? Possibly because an unknown research assistant at a monitor manufacturing company recalled that the human eye has a peak sensitivity in the middle of the spectrum of visible light—the amber-green portion. It follows, viscerally at least, that if that's where our eyes peak, that's the color that should be on a CRT.

The trouble is, this has never been

borne out scientifically. Marvin Dainoff, professor of psychology at Miami University (Oxford, Ohio), has done ergonomic studies of video display terminals for the National Institute for Occupational Safety and Health (NIOSH). He claims: "There is no conclusive evidence either way—there are no performance data that suggest green, amber or white is best."

Wanda Smith, a member of an American National Standards Institute (ANSI) committee trying to develop international ergonomic standards, and a human factors engineering manager for Hewlett-Packard in Cupertino, Calif., elaborates: "There is no scientific substantiation for any color—no evidence shows that one is less fatiguing





*Knowing the terms is one thing,  
translating them into practical  
guidelines is another.*

unit has medium resolution. A figure below 0.31 generally indicates a high-resolution monitor.

The last technical term to be aware of is bandwidth. The scientific explanation for bandwidth is the horizontal number of lines times the scan frequency times the blanking lines. In practical terms, bandwidth is an indication of the speed at which the moni-

tor can use the information fed to it by the computer. It's important to match up the bandwidths (measured in megahertz) of your computer and monitor. The higher the bandwidth, the faster the monitor can accept information. If your monitor has a higher bandwidth than your computer, you may wind up paying for capacity you can't use. "The higher

the bandwidth, the better potential you have," says Zenith's Dave Green. "But be sure your computer can utilize it."

Knowing the terms used in monitor technology is one thing; translating them into practical guidelines on which to base a choice is another. But there is a fairly straightforward way to go about this—use the same

to the eye, or less stressful on the eye, or that there is better or worse performance with one versus another. I've been studying this and related questions for years and I've really tried to find certain colors that would be best, because the companies that I worked for would have loved to have the information. I honestly couldn't do it, much to their dismay. If anybody can find a study that validly concludes one color is better than another, please send it to me—I've never seen one."

The world's largest computer company agrees. IBM's Bruce Rupp, manager of the company's physiological optics laboratory in San Jose, Calif., says, "IBM has done testing and has found no significant difference between green and amber in terms of human performance."

If it's not color, what does cause problems at a terminal? People do, after all, complain of eyestrain. "There has been a lot of speculation," Dainoff says, "but I don't know how well founded any of it is. If you sit in one position for a long time, reading a newspaper, a magazine, or looking at a screen, you're going to get eyestrain."

Unfortunately, as with many empirical matters, it's a matter of gathering evidence in an area that isn't fully understood. "Finding the final answer, if there is one, would take a lot of careful effort—and that's not likely to happen soon," says Dainoff. "The reason is that you're talking about very subtle differences in visual functions and right now, at least, these are not understood. Physiologically, we do not understand what eye fatigue is. The

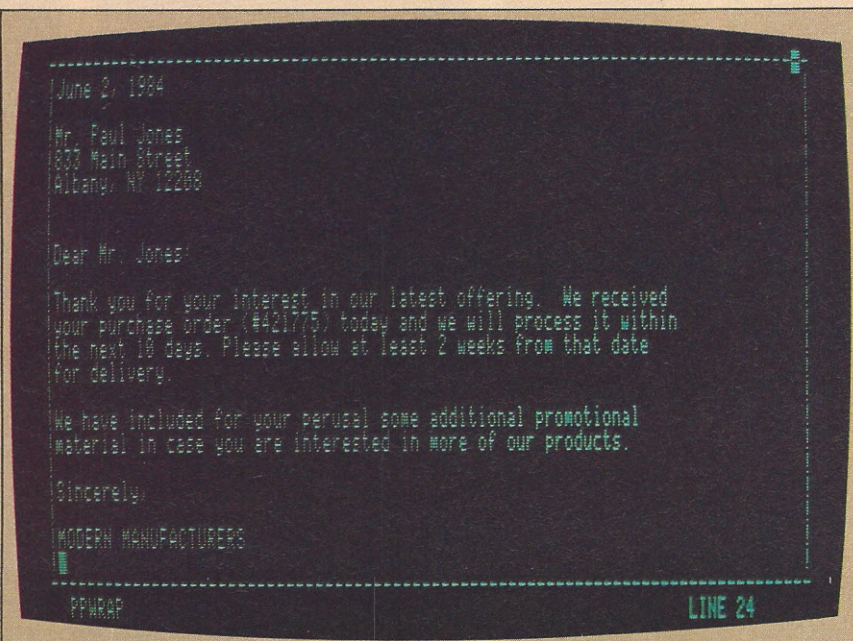
only measure of eye fatigue that has any validity at all is to ask someone if their eyes hurt."

Why select any one color over another? "It comes down to preference," Dainoff says.

Just how large a role preference plays in this question was demonstrated by a recent nationwide survey. "The last survey we did, based on a nationwide sampling of 400 users, showed that people are beginning to prefer amber screens," says Chris Whichard, president of Boston's Advanced Resources Development, a marketing research firm. "When asked what their future preference would be, 30 percent said they would like white, 50 percent said they would probably want green and amber totaled 14 percent, which represented an increase over what they had used. Moreover, in another poll, 18 percent said that the amber color was an important feature."

Should you buy amber? If you want, but don't pay extra because of some claimed scientific rationale. As Richard Koffler says, "Some people like amber, some people like green—fine. If you like purple, fine—pink for girls, blue for boys—it doesn't matter. Why should it matter? Look around your office, there are plenty of colors. Is there anything you can't see? Is there anything giving you eyestrain from looking at it? It's contrast that counts—the contrast has to be great enough. A purple display with a high contrast ratio and no flicker will be better than a display that flickers in green."

"Look," he says, "after millions of years of evolution, the eye is not going to suddenly reject certain colors—the sky is blue and nobody gets eye fatigue from looking at the sky, right?"





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*Check the readability of the characters and the sharpness of the image—and watch out for glare.*

**BUYER'S GUIDE**

guidelines you used (or should have used) when choosing your computer. Ask yourself one basic question: What are you going to use your monitor for? The answer should help you narrow your choice to a handful of monitors that will do the job you need done, at a price you can afford. (Monochrome monitors start at \$100, composite color units hover in the \$300 range, RGBs start at around \$500 and go up into the thousands. Check the comparison tables for exact prices.)

If the monitor will be used mainly for entertainment or educational games, a composite video unit should do the job. A monochrome monitor wouldn't give you the full benefit of the color used in most entertainment software and an RGB monitor could be an unnecessary expense.

If your main application is word processing, a monochrome monitor will be fine. In fact, you may even prefer it—it can be hard to read a low-resolution color screen full of text. An RGB monitor, while certainly clear enough for text processing, is probably more monitor than you'll need for word processing. If you go for a monochrome, you'll have another choice to make—what color background and what color display do you want? The main choices are green on a black background, or amber on a green or black background.

While the green display is more traditional, some people experience eyestrain from using these monitors for long periods of time. Another harmless yet potentially irritating side effect of green displays is what's known as the McCollough effect, a physiological phenomenon that causes white edges to appear pink to people who have been staring at a green display for long periods. Amber monitors are designed to eliminate these problems, and while some studies have shown a reduction in eyestrain among people who use amber displays (see sidebar), others find them difficult to read. It comes down to a matter of individual taste.

If you need detailed color display of charts, graphs and other business graphics, or if you're planning to get into creative graphics and animation, an RGB monitor is probably the best bet.

These selection criteria may sound a bit simplistic. After all, most computer users do more than one thing with their systems. The idea is to pinpoint the *main* intended use for the monitor and make it the main criterion for selection.

Once you've formed ideas about the price and type of monitor, the smart thing to do is some window shopping. Make the rounds of computer retailers and take a hard look at what monitors they offer. If possible,

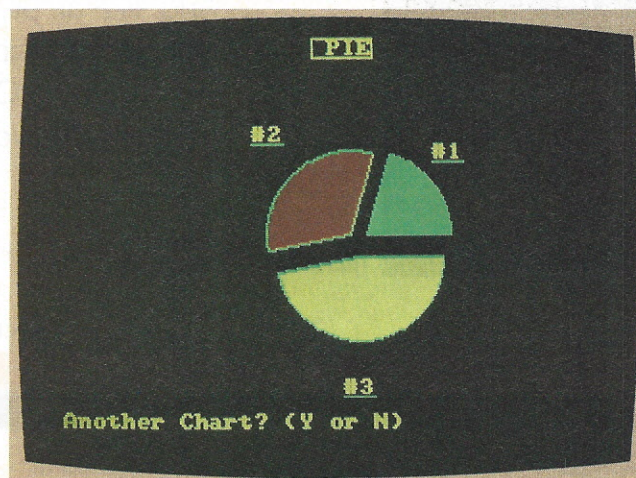
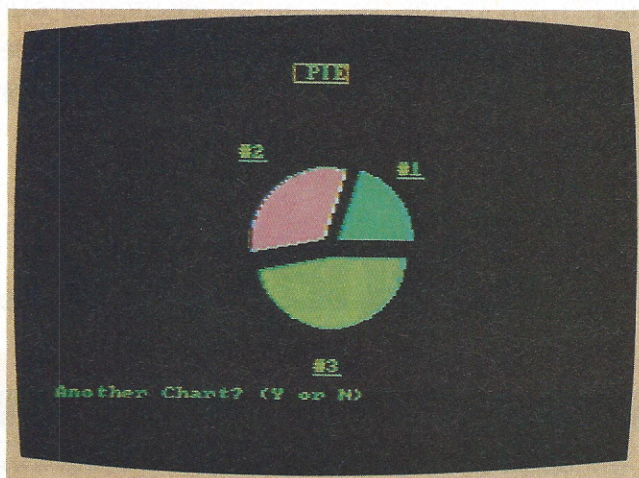
have the dealer boot some of the software you'll be using so you can see how it looks on various brands and models of monitors.

When you're looking at a monitor, check the size and readability of the characters and the sharpness of the images and watch out for glare from the screen. Many monitors have specially coated screens to reduce glare; others may require the addition of a glare protection device such as a nylon mesh screen which fits over the monitor screen and deflects light.

Look to see if the text image is clear and steady. Characters near the edge of the screen shouldn't be unacceptably fuzzy and the letters shouldn't flicker or waver. Look at each individual letter. Note how many dots comprise a character and compare what you see with other monitors in the store. In other words, let your eyes be the judge. As Scott Fisher, technical support manager at Quadram Corporation says, "Visually you can tell immediately which of several monitors is best."

Check to see if the monitor has a brightness control and/or contrast or focus control which allow you to adjust the display to the light level of your workplace. Check their position

**The difference between a composite color monitor (Panasonic DTS101, left) and a RGB monitor (Panasonic DTH103, right) is illustrated by showing the same image.**

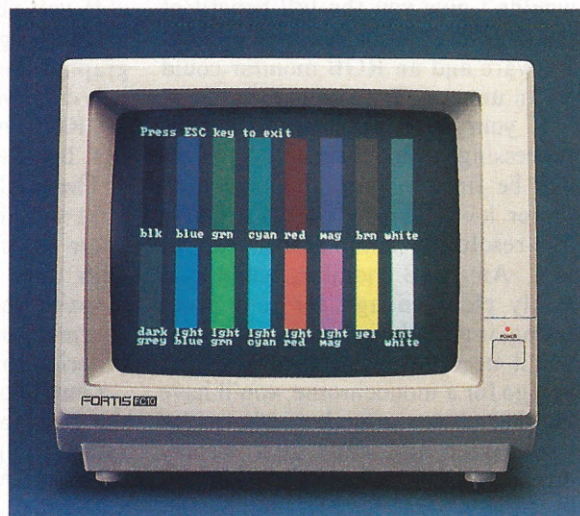




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(617) 933-8162

### ■ N. CALIFORNIA

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Sunnyvale, CA 94086  
(408) 730-1712



***"If you have an expensive computer, you shouldn't buy the cheapest monitor made."***

## BUYER'S GUIDE

too. It's inconvenient to have to fumble for controls located on the back of the unit.

What about screen size? Monitor screens are generally measured diagonally; 9", 12" and 13" are typical sizes. Compare to see which you prefer, but keep in mind the size of your computer: Don't buy a monitor that's too large or too heavy for your machine to support.

Are there other compatibility issues to consider? According to Gerry Holland of Taxan Corporation, compatibility between computer and monitor is almost never a problem with monochrome or composite color monitors. But, says Zenith's Dave Green, "When buying an RGB monitor, make sure both your computer

and the monitor comply with the NTSC (National Television System Commission) standard, the standard to which television sets conform. If your computer doesn't, then get back to the manufacturer to find out which monitor will work."

There is another, more subtle compatibility issue: You really should buy a monitor that is comparable in quality to your computer, according to Linda Levine, marketing specialist for NEC Home Electronics. "If you have an expensive, top-of-the-line computer with all the bells and whistles on it, you shouldn't buy the cheapest monitor made," says Levine. "And if you have a very inexpensive computer, it makes little sense to use a very high quality moni-

tor with it." The reason? "The monitor picks up everything the computer puts out and a low-end computer cannot put out a clear, refined signal—it's just not up to it."

How long can you expect a monitor to last? According to Doug McElroy of Princeton Graphics, "Even driving a monitor hard, you can expect it to last a minimum of five to six years, probably longer."

As with most products, the more you pay, the better quality monitor you can expect. Specifications may impress you, but you won't be looking at specifications for hours at a time, you'll be looking at a screen. Don't worry about getting the best monitor ever made; just get the one that's best for you.

### A BUYER'S GUIDE TO MONITOR MANUFACTURERS

ALGOL TECHNOLOGY, INC.  
303-3 Convention Way  
Redwood City, CA 94063  
(415) 364-8314

AMDEK  
2201 Lively Blvd.  
Elk Grove Village, IL 60007  
(312) 364-1180

APPLE COMPUTER CO.  
20525 Mariani Ave.  
Cupertino, CA 95014  
(408) 996-1010

AYDIN CONTROLS  
414 Commerce Dr.  
Fort Washington, PA 19034  
(215) 542-7800

COMPUTER SYSTEMS  
26401 Harper Ave.  
St. Clair Shores, MI 48081  
(313) 779-8700

COMREX INTERNATIONAL, INC.  
3701 Skypark Dr.  
Suite 120 Torrance, CA 90505  
(213) 373-0280

CONRAC CORPORATION  
600 N. RIMSDALE AVE.  
COVINA, CA 91722  
(818) 966-3511

DYNAX  
5698 Bandini Blvd.  
Bell, CA 90201  
(213) 260-7121

ELECTROHOME, LTD.  
250 Wales Ave.  
Tonawanda, NY 14150  
(716) 694-3332

HITACHI SALES CORP. OF AMERICA  
401 W. Artesia Blvd.  
Compton, CA 90220  
(213) 537-8383

IBM  
P.O. Box 1328  
Boca Raton, FL 33432  
(305) 998-2000

LEADING EDGE PRODUCTS, INC.  
225 Turnpike St.  
Canton, MA 02021  
(800) 343-6833  
(617) 828-8150

MICRO DISPLAY SYSTEMS, INC.  
P.O. BOX 455  
1310 Vermillion St.  
Hastings, MN 55033  
(800) 328-9524  
(612) 437-2233

MICROTOUCH SYSTEMS, INC.  
400 West Cummings Park  
Woburn, MA 01801  
(617) 935-0080

NEC HOME ELECTRONICS (U.S.A.), INC.  
1401 Estes St.  
Elk Grove Village, IL 60007  
(312) 228-5900

PANASONIC  
One Panasonic Way  
Secaucus, NJ 07094  
(800) 222-0584 (outside N.J.)  
(201) 348-5337

PRINCETON GRAPHIC SYSTEMS  
1101-I State Rd.  
Princeton, NJ 08540  
(609) 683-1660

QUADRAM CORP.  
4355 International Blvd.  
Norcross, GA 30093  
(404) 923-6666

SAKATA U.S.A. CORP.  
651 Bonnie Lane  
Elk Grove Village, IL 60007  
(800) 323-6647  
(312) 593-3211

SANYO BUSINESS SYSTEMS CORP.  
51 Joseph St.  
Moonachie, NJ 07074  
(201) 440-9300

SONY CORPORATION OF AMERICA  
Office Products Division  
1 Sony Dr.  
Park Ridge, NJ 07656  
(201) 930-1000

TEXAS INSTRUMENTS  
P.O. Box 402430  
Dallas, TX 75240  
(800) 527-3500  
(214) 995-6611

TAXAN CORP.  
18005 Cortney Ct.  
City of Industry, CA 91748  
(213) 810-1291

USI INTERNATIONAL  
71 Park Lane  
Brisbane, CA 94005  
(415) 468-4900

ZENITH DATA CORP.  
1000 Milwaukee Ave.  
Glenview, IL 60025  
(312) 391-7000



## BUYER'S GUIDE TO MONITORS

COMPANY/ MONITOR	PRICE	COMPATIBILITY	DIAGONAL SCREEN SIZE (in.)	NO. OF TEXT COLUMNS X NO. OF TEXT ROWS	SCREEN COLORS	PIXEL RESOLUTION	BAND WIDTH (MHz)	DOT PITCH (mm)
ALGOL TECHNOLOGY, INC. CM-70	\$550	RGB	13	80 × 25		720 × 460	T5	.31
CR-13NL	\$329	CV	13	40 × 24		320 × 280	4.25	NA
AMDEK Color I	\$379	CV	13	40 × 25		320 × 260	3	.63
Color I+	\$399	CV	13	40 × 25		320 × 260	3	.63
Color II+	\$559	RGB	13	80 × 25		640 × 400	9	.43
Color IV	\$799	RGB	13	132 × 50		720 × 420	16	NA
Video 300	\$179	CV	12	80 × 25	green	960 lines	18	
Video 300A	\$179	CV	12	80 × 25	amber	960 lines	18	
Video 310A	\$230	CV	12	80 × 25	amber	960 lines	18	
APPLE COMPUTER CO. Monitor II	\$229	CV	12	80 × 24	green	900 lines	NA	
Monitor III	\$249	CV	12	80 × 24	green	900 lines	NA	
AYDIN CONTROLS 8810	\$1500	RGB	13	80 × 25		640 × 480	25	.31
8830	\$1800	RGB	19	80 × 25		640 × 480	25	.31
8835	\$2500	RGB/Analog	19	80 × 25		1280 × 1024	40	.31
8072	\$8850	RGB/Analog	25	80 × 25		1280 × 1024	50	.37
8073	\$8250	RGB/Analog	25	80 × 25		640 × 480	24	.37
COMPUTER SYSTEMS C	\$250-1311; \$350-1911	CV	13, 19	80 × 25		350 lines	20	.42
CR	\$590-1311; \$729-1911	RGB	13, 19	80 × 25		600 × 400	30	.31
COMREX INTERNATIONAL, INC. CR-5400	\$100	CV	9	80 × 25	green, yellow- green and amber	800 lines	20	
CR-5600	\$135-green and yellow- green; \$149-amber	CV	12	80 × 25	green, yellow- green and amber	1000 lines	20	
CR-6500	\$349	RGB	13	80 × 25		260 × 300	NA	NA
CR-6600	\$399	RGB	13	80 × 25		380 × 240	NA	.62
CR-6800	\$699	RGB	14	80 × 25		740 × 400	22	NA
CONRAC CORPORATION ENA 9N	\$580	CV	9	80 × 25	black/ white, green	600 lines	10	

RGB—red, blue, green system; except where indicated, digital output is required.  
 CV—composite video system.  
 NA—information not available from manufacturer. Where not applicable, column is left blank.

<sup>1</sup>Touch-sensitive screen for IBM PC.  
<sup>2</sup>Quadscreen system comes with controller board and monitor.  
<sup>3</sup>Sony's color monitors can be used with both analog and digital RGB output.  
<sup>4</sup>Can be used with analog or digital RGB output or NTSC, PAL, or SECAM output.  
<sup>5</sup>Switchable to monochrome display.



COMPANY/ MONITOR	PRICE	COMPATIBILITY	DIAGONAL SCREEN SIZE (in.)	NO. OF TEXT COLUMNS X NO. OF TEXT ROWS	SCREEN COLORS	PIXEL RESOLUTION	BAND WIDTH (MHz)	DOT PITCH (mm)
ENA 12N	\$610	CV	12	80 × 25	black/ white, amber	600 lines	10	
QQA 15N	\$3135	CV	15	80 × 25	black/ white	1280 × 960	30	
QQA 17N	\$3255	CV	17	80 × 25	black/ white	1280 × 960	30	
QQA 21N	\$3820	CV	21	80 × 25	black/ white	1280 × 960	30	
SNA 9N	\$1055	CV	9	80 × 25	black/ white, green	800 lines	10	
SNA 15N	\$1195	CV	15	80 × 25	black/ white, green	800 lines	10	
SNA 17N	\$1355	CV	17	80 × 25	black/ white, green	800 lines	10	
SNA 23N	\$1690	CV	23	80 × 25	black/ white, green	800 lines	10	
2400	\$2830	CV	19	80 × 25	black/ white, green	1280 × 960	40	
DYNAX Fortis AM-30	\$179	CV	12	80 × 25	amber	600 lines	20	
Fortis GM-30	\$179	CV	12	80 × 25	green	600 lines	20	
Fortis SC-10	\$599	RGB	13	80 × 25		640 × 240	30	.43
ELECTROHOME, LTD. ECM 1301	\$1495	RGB	13	80 × 25		720 × 512	25	.31
HITACHI SALES CORP. OF AMERICA CM 1481	\$379.95	CV	13	32 × 24		260 × 300	3.7	.60
MM 1218	\$222.95	CV	12	80 × 24	green	1250 lines	15	.39
IBM Color Display Monitor	\$680	CV	11.5	80 × 25		640 × 200	NA	
IBM PCjr Color Display	\$429	RGB	13	40 × 25		320 × 200	NA	.63
Monochrome Monitor	\$345	CV	11.5	80 × 25	green	640 × 200	NA	
LEADING EDGE PRODUCTS, INC. Gorilla	\$99	CV	12	80 × 25	amber, green	850 × 245	22	
MICRO DISPLAY SYSTEMS, INC. Genius VHR Monitor	\$1150	CV	15	80 × 60/25	amber, green, soft white, white	720 × 990	80	
MICROTOUCH SYSTEMS, INC. <sup>1</sup> Composite Video	\$1495	CV	12	80 × 25	amber	640 × 200	18	



# BUYER'S GUIDE TO MONITORS

COMPANY/ MONITOR	PRICE	COMPATIBILITY	DIAGONAL SCREEN SIZE (in.)	NO. OF TEXT COLUMNS X NO. OF TEXT ROWS	SCREEN COLORS	PIXEL RESOLUTION	BAND WIDTH (MHz)	DOT PITCH (mm)
TTL	\$1495	CV	12	80 × 25	amber	720 × 350	18	
NEC HOME ELECTRONICS JB902	\$189	CV	9	80 × 25	green	700 × 320	20	
JB1201	\$199	CV	12	80 × 25	green	800 × 230	20	
JB1205	\$199	CV	12	80 × 25	amber	800 × 230	20	
JB1260	\$150	CV	12	80 × 25	green	600 × 230	15	
JB1410 P2	\$249	RGB	14	80 × 25		640 × 400	23	NA
JC1215A	\$399	CV	12	40 × 25		250 lines	NA	
JC1216A	\$599	RGB	12	80 × 25		640 × 240	10	NA
JC1410P2	\$998	RGB	14	80 × 25		640 × 400	23	NA
JC1460	\$499	RGB	14	80 × 25		500 × 280	10	NA
PANASONIC DTD1000G	\$450	RGB	10	80 × 25		330 × 220	10	.52
DTD1300G	\$500	RGB	13	80 × 25		450 × 240	10	.50
DTH103	\$753	RGB	10	80 × 25		640 × 500	15	.31
DTM140	\$699	RGB/CV	14	80 × 25		550 × 240	NA	.43
DTS101	\$300	CV	10	40 × 25	black/ white	300 × 300	5.2	.62
TR120M1PA	\$220	CV	12	80 × 25	green	1100 lines	20	
TR120MDPA	\$240	CV	12	80 × 25	amber	1100 lines	20	
PRINCETON GRAPHIC SYSTEMS HX-12	\$695	RGB	12	80 × 24		690 × 240	15	.31
MAX-12	\$249	Digital	12	80 × 24	amber	800 × 350	18	
SR-12	\$799	RGB	12	80 × 24		690 × 480	25	.31
QUADRAM CORP. Quadchrome	\$695	RGB	12	80 × 25		690 × 480	15	.31
Quadscreen <sup>2</sup>	\$1995	Digital	17	160 × 64	green	960 × 512	41	
SAKATA U.S.A. CORP. SA-1000	\$159	CV	12	80 × 25	amber	900 lines	18	
SC-100	\$329	CV	13	40 × 25		280 × 300	NA	.65
SC-200	\$649	RGB	13	80 × 25		640 × 240	NA	.39
SC-300	\$899	RGB	13	80 × 25		720 × 240	NA	.31
SG-1000	\$129	CV	12	80 × 25	green	900 lines	18	
SANYO BUSINESS SYSTEMS CORP. CRT-36	\$179	CV	12	80 × 25	green	640 × 400	18	
CRT-70	\$699	RGB	15	80 × 25		640 × 400	18	.3
SONY <sup>3</sup> CPD-120	\$280	CV	12	80 × 25	green	640 × 400	NA	
CPD-1200	NA	RGB/analog/ digital	12	100 × 25		800 × 240	15	.25



COMPANY/ MONITOR	PRICE	COMPATIBILITY	DIAGONAL SCREEN SIZE (in.)	NO. OF TEXT COLUMNS X NO. OF TEXT ROWS	SCREEN COLORS	PIXEL RESOLUTION	BAND WIDTH (MHz)	DOT PITCH (mm)
CPD-9000	NA	RGB/analog/ digital	9	80 × 25		640 × 240	15	.25
KX-8200CD	\$795	RGB/analog/ digital	8	80 × 25		640 × 200	13	.25
KX-1211HG	\$895	RGB/analog/ digital	12	80 × 25		640 × 240	10	.4
KX-1901A	\$850	RGB/analog/ digital	19	80 × 25		320 × 200	10	.8
PVM-127Q <sup>4</sup>	\$915	RGB/analog/ digital	12	80 × 25		800 × 200	15	.25
TAXAN CORP. 115	\$179.95	CV	12	80 × 25	green	800 × 240		
116	\$189.95	CV	12	80 × 25	amber	800 × 240		
121	\$219	Digital	12	80 × 25	green	1000 × 360		
122	\$229	Digital	12	80 × 25	amber	1000 × 360		
210	\$399.95	RGB/CV	12	80 × 25		380 × 240	15- RGB 6-CV	.63
400	\$399.95	RGB	12	80 × 25		380 × 240	15	.63
410	\$499	RGB	12	80 × 25		510 × 260	15	.47
411 <sup>5</sup>	\$549.95	RGB	12	80 × 25		510 × 260	15	.47
415	\$629.95	RGB	12	80 × 25		640 × 240	18	.38
420	\$649.95	RGB	12	80 × 25		640 × 240	18	.38
422	\$699.95	RGB	12	80 × 25		640 × 240	18	.38
425 <sup>5</sup>	\$699.95	RGB	12	80 × 25		640 × 240	18	.38
440 <sup>5</sup>	\$995	RGB	12	80 × 25		740 × 400	25	.31
USI INTERNATIONAL 900/A	\$225	CV	9	80 × 25	amber	1000 lines	20	
900/G	\$199	CV	9	80 × 25	green	1000 lines	20	
1200/A	\$225	CV	12	80 × 25	amber	800 lines	20	
1200/G	\$199	CV	12	80 × 25	green	800 lines	20	
1400/C	\$398	CV	14	40 × 25		300 × 240	14	.60
ZENITH DATA CORP. ZVM-122	\$169	CV	12	80 × 25	amber	640 × 240	15	
ZVM-123	\$139-polished screen; \$169-non- glare	CV	12	80 × 25	green	640 × 240	15	
ZVM-124	\$199	CV/digital	12	80 × 25	amber	720 × 350	22	
ZVM-131	\$379	RGB/CV	13	40 × 25		390 × 240	RGB-6 CV- 2.5	
ZVM-133	\$559	RGB	13	80 × 25		640 × 240	15	.41
ZVM-135 <sup>4</sup>	\$599	RGB/CV	13	80 × 25 RGB 40 × 25 CV		640 × 240	20- RGB 3-CV	.43
ZVM-136	\$799	RGB	13	80 × 25		640 × 240	20	.41



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a major revision  
of the fundamental  
law of computing.





Garbage in, garbage out.

Since computers were invented, the conventional wisdom has held that input that doesn't conform to the computer's highly structured needs will result in unintelligible output.

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DayFlo offers a new approach to database management needs. It's a Fluid Format™ Personal Information Manager. Which means it approaches the world the same way you do: taking in unorganized data and organizing it into meaningful information.

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Information from other programs, spreadsheets, word processing or accounting files, virtually any data in the system can be assimilated by DayFlo. And once the information is at hand, DayFlo lets you manipulate it at will to produce letters, memos, reports and much more. You can work at your computer the same way you work at your desk, even switching quickly from task to task, without ever losing your place.

DayFlo's concept is as simple as it is revolutionary. You no longer have to think for the computer. Instead, it can help you think better for yourself. Which leads, inevitably, to a brand-new version of computing's fundamental law.

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# The U.P.S. and Downs of Business



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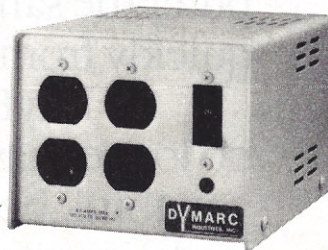
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\*based on IEEE data.



## Mixing And Matching Computer Components

**I**f you have questions dealing with hardware, software or applications, Personal Computing will answer them in this monthly column. Please send your 'need-to-knows' to: Answers, Personal Computing, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604.

**Q:** Can I safely use non-Apple disk drives with Apple computers?

**A:** Bonny Holland, marketing manager of Computer Repair Center, Santa Clara, Calif., says yes... with some reservations. You should make sure you know who can service the drive before you buy it—if it has to be sent back to the manufacturer for service, or if your local dealer or service operation can handle it. And to be on the safe side she recommends sticking to the better-known brands (like Amdek and Rana).

A second problem, Holland says, is that "Apple-compatible" doesn't necessarily mean totally Apple-compatible. There are some pieces of software that may not work, which has to do with how the program addresses the disk drive and controller board electronics. Holland reports having trouble with a very cheap drive and VisiCalc. But she adds that the most frequent sources of software that doesn't boot properly are disk drive speed out of tolerance for the program, and head alignment problems—both of which can occur with Apple drives as easily as with others (an argument for buying from a local dealer who can quickly fix such

problems—they usually just require a simple, quick adjustment).

Another important consideration, according to Holland, is the fact that disk drives should be aligned once a year. She reports difficulty getting the required schematic diagrams and alignment procedures from some drive makers. A good hint would be to check with your dealer and see if he has schematics and procedures on file for the drive you're thinking of buying.

**Q:** Why isn't there some kind of industry standard so I can take diskettes from one computer and use them in another?

**A:** "Because everybody slices their pies differently," says Randy Savoy, general manager of Triangle Computer Systems, Inc. in Campbell, California. "They do need to come up with some kind of standard that's a standard," he says.

On the bright side, incompatibility has been a widely recognized problem, and we can't imagine manufacturers will ignore the public's distressed cries for a solution. Let's hope the industry develops some consistent standards soon.

**Q:** I see ads for computers that sell for \$200 or less. What are the reasons, pro and con, for buying an inexpensive computer?

**A:** The advertised price you're referring to is generally for the basic CPU and nothing more, explains Dan Firebaugh of ComputerLand of Central Georgia. The final

price of some of these machines will be considerably higher if you intend to add disk drives or a monitor, for example. It would be wise, Firebaugh says, to think about what your maximum computing needs might be and compare them to the maximum potential of one of these low-end machines. If you want to use a personal computer for large spreadsheets in your business, for example, a low-end machine won't be enough.

On the other hand, if what you're after is just an introduction to what a personal computer can do for you, it might pay to buy an inexpensive personal computer with limited capability. If using it convinces you of the viability of using a computer in your business, you can always buy something more suited to business tasks. And, if you decide computing isn't for you, you really haven't lost a large investment.

**Q:** Which is better, a parallel or serial interface for a printer?

**A:** Neal Feldman, service manager for Quest Computers in Oakland, Calif., recommends that first-time users buy a parallel printer. "With serial printers, you have to worry about parity, baud rate, wiring configurations... the more you have to worry about the more that can go wrong," he says. "With parallel, you just plug the thing into the computer and into the parallel port and it works."

While Feldman agrees that you can do more with a serial printer, he doubts that most owners will use the sophisticated features. Most printers



# New.

## Sentinel Color Diskettes.



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# Sentinel

TECHNOLOGIES

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won't print at the faster baud rates offered by the serial port anyway. "If you have a 20 character-per-second printer, it doesn't matter how fast the port is," Feldman says.

**Q:** I am thinking of starting a computer club in my fifth-grade class. We have an Apple II. I would like some advice on how to get started with my computer club.

**A:** The first thing you and your classmates should do is contact a couple of local Apple dealers to find out how to get in touch with the Apple user's group in your area. Someone in that group would probably be glad to come in and talk to your class about their club and give you hints on how to use the Apple, as well as tell you about the neat things you can do with it.

In addition, if your Apple has a modem, you might want to get a subscription to CompuServe, a telecommunications network for computers, and talk through your computer with the CompuServe Apple user's group, which has members all over the country.

**Q:** How long can a printer cable be before you start getting interference?

**A:** Interference varies according to location, according to Neal Feldman of Quest Computers in Oakland, Calif. "An antenna is simply a wire, so if you have a printer cable that's really long, you are likely to get some radio interference," he says. This makes it hard for the printer to do its job.

"If you live in the middle of nowhere, you don't have to worry," he says. But if you live in an urban area, you can run into heavy radio interference. Feldman recommends you keep your cable under 10 feet if you live within a mile of a transmitting tower—otherwise you can probably go to a maximum of 20 feet.

**Q:** The people who help me at computer stores all seem to be very busy. Is it possible to get undivided attention?

**A:** Sure—some computer retailers prefer that customers call and set up an appointment rather than just dropping in. "For us," says Jim Queen of the Fremont, Calif., ComputerLand, "it means we can make sure someone is free and prepared to devote full attention to understanding the customer's needs. Both sides get an opportunity to feel each other out at their leisure, which is important in any potentially long-term business relationship."

**Q:** I am considering buying a modem for my Apple II, but the more information I get, the more I become confused. What's the difference between 300, 1200 and 2400 baud? What's an RS-232-C interface and do I need one? What is a terminal program?

**A:** Many computer owners are seeking to expand their computer capabilities to include communicating with other computers over the telephone lines just as you are, according to Greg Ferguson of Microcom, a manufacturer of communications hardware and software. Communicating using your personal computer is another adventure with a new set of terms and requirements to understand.

The term "baud" refers to the speed at which your computer communicates. Although baud technically means bits per second, you can use the character equivalents. One character is equal to 10 baud. So 300 baud is equivalent to 30 characters, 1200 baud equals 120 characters and 2400 baud 240 characters which are transmitted per second. The baud rate also plays an important role when you communicate. Both the sending and receiving computer must use the same baud rate.

Three hundred and 1200 baud

modems are the most commonly used by personal computer users and various commercial data bases. Twenty-four hundred baud modems are expensive and will greatly reduce the number of other computers you will be able to communicate with.

Stand alone modems, those modems that are not installed inside your computer, require an RS-232-C interface circuit board to be installed inside your computer. This board transforms the signal in your computer into a form that is acceptable to your modem. Your computer uses data in parallel form while a stand alone modem requires the data in serial form. The RS-232-C interface is not required for modems that are installed inside your computer.

To transfer data from your computer to the remote computer and to receive incoming messages, you'll need special software that will handle this communications traffic. This is called terminal software. It is important that you make sure the terminal software you purchase is designed to interface with your modem. Although the terminal software and your modem must be compatible, the remote computer need not have the same terminal software as yours to successfully communicate.

**Q:** I'm considering the purchase of a Commodore. Can I use my own cassette recorder as the cassette drive instead of buying the cassette drive Commodore sells?

**A:** Yes you can, with a special converter interface, says Lewis Watmore, assistant technical support representative at Computer Center Stores in San Jose, Calif. But he doesn't recommend it.

"You're better off by buying a Datasette (Commodore's cassette drive, priced at \$75). You'll be a lot happier, and have fewer errors." The Datasette records a better signal for storing digital information than most inexpensive recorders would.



**Q.** Software seems so expensive considering that all you get is a manual and a few diskettes. Couldn't you save a lot of money by taking a programming class and writing your own?

**A.** Maybe, if your time is cheap, says Dave Sumner of ComputerLand of Central Georgia. Writing a computer program worth using is a lot like writing a novel worth reading. It's easy to learn to write. But writing a best-selling novel takes time, perhaps years, and is only possible if you have a natural knack for writing. The same can be said for writing software.

Compared to the cost in man-hours of doing it yourself, buying software is probably a bargain.

**Q.** Are there any disk drives other than the Commodore 1541 which are compatible with the Commodore 64?

**A.** The answer to that is not as straightforward as you'd expect. The folks at Commodore say they're not aware of any that will work with the 64, yet there does appear to be at least one company that markets compatible drives.

MSD Systems, Inc. of Dallas makes both a single and dual drive that is compatible with the VIC 20, the Commodore 64, and the PET machines. The advantage to using these drives, called the MSD Super Disk Drives, is that they can be hooked up to either a parallel or serial port (interface cables included) which means they can run up to 2½ times faster than Commodore's 1541 drive.

The disadvantages of the MSD drives are that they are more expensive (\$399 for the single, \$699 for the dual) than the 1541 and are probably a bit harder to find. To find out where you can purchase the MSD drives, contact: MSD Systems, 10031 Monroe Dr., Suite 206, Dallas, TX 75229; (800) 527-5285.

The reason why manufacturers are not fast and furiously turning out compatible disk drives for the Commodore computers, by the way, is that all of the technology needed to run the drive must be "on board" or in the drive unit itself, according to MSD's Cherry Gaberdiel. Keeping all the technology needed to run the disk drive in the drive itself keeps the price of the computer down, but keeps the cost of adding drives high.

**Q.** What are the pros and cons of getting a non-Atari disk drive for my Atari 800XL?

**A.** Dave Graham at Sun Computers in Huntington Beach, Calif., says non-Atari drives can work fine, and adds that you can't apply lessons you've learned about the Apple disk drive market to Atari.

This is because the Atari drive design is much more "intelligent," so the alternate drive maker has much less control over the drive's design. With an Apple, for instance, initializing disks is done by the operating system software. With an Atari, all the computer does is send the "initialize" command to the disk drive, and that device implements the command automatically.

Consequently, the only challenge to an independent drive company is the fact that Atari has several different drive designs in effect. It started out as a single-density drive, and the DOS imposed a rigid limit of 1000 sectors, although adding to the information per sector was possible.

Their 815 double-density disk drive used 256-byte sectors, but Atari withdrew the drive from the market after experiencing problems with the unit's design. More recently they introduced the 1050 drive that writes only 128 bytes per sector, but has more sectors—the limit of 1000, instead of the 650 or so found with previous models. Instead of full double density, consequently, you're getting more like 1.4 density.

Atari's DOS has also been altered with the introduction of the new models in the XL series—more than once, according to Graham. This has made some programs written for the 800 not work on the 800XL, and some people have blamed the disk drive—but Graham says these problems have cropped up just as much on Ataris with factory drives, and it has necessitated much rewriting of software by the vendors.

Graham says that some independent drives, like the Indus GT, have been designed for compatibility with all three Atari drives: the 810, the 815, and the 1050. He recommends looking for this kind of compatibility to ensure the widest software choice. Graham points out that other drives also have more special features. The Indus, for instance, has a write-protect button on it. This enables the owner to protect disks in the drive from accidental erasure without having to mess with adhesive tabs on the diskette itself. It also comes with "trainer" versions of popular business software.

**Q.** I use my computer in a room that doesn't have a constant heat source, and on some winter nights, the temperature can be close to freezing. When I start using the computer, the heat the system generates will warm it to close to 100 degrees within a few minutes. Will this drastic change in temperature do any harm to the computer?

**A.** You shouldn't have any problems from the change in temperature itself, says Neal Feldman, technician at Quest Computers in Oakland, Calif. But if the room temperature did drop to near zero, then you might get moisture condensing inside the system when you start to use it. If there's any chance that your room temperature might drop significantly below freezing, you should heat the area or move the computer to a warmer place.



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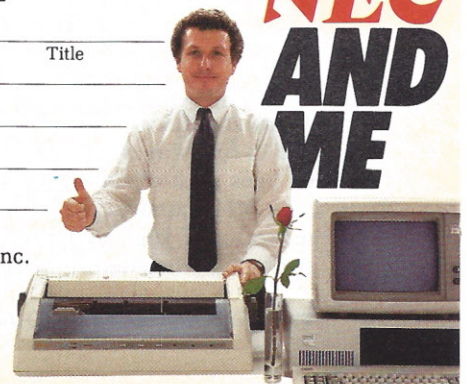
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## NEC AND ME





**Q:** What is a soft switch and how do I activate one?

**A:** According to Bill Rea, an engineer at Videx, a firm that manufactures soft switches that convert the 40-column Apple II output into 80 columns, a soft switch is activated electronically through the use of a computer program.

The soft switch is set to activate Drive 1 when the computer is turned on. Once the disk operating system has been loaded into your computer, you can then select which drive you wish to use by typing the proper commands. The switch detects these commands and toggles the switch activating the desired disk drive. The switch will remain in the toggled position until, 1) another command is received to select a different disk drive or 2) the soft switch is reset by turning the computer off and then on.

To activate a soft switch you must send the proper signal to the computer address at which the switch is located. For that reason most personal computer users interface with a soft switch indirectly through the use of software.

**Q:** Is it true that the resolution of a monitor depends on the number of pixels that the software can handle?

**A:** No. Steve Sana, an engineer from NEC, a leading monitor manufacturer, reports that resolution depends on the bandwidth of the monitor but also involves the character generator in your personal computer.

The resolution frequently referred to when talking about monitors is the horizontal resolution which is the number of horizontal lines on the screen and this is directly related to the bandwidth of the monitor. A good rule to follow is that you should have 80 lines of horizontal resolution for each MHz bandwidth. The character generator of your computer becomes important when determining the best

bandwidth for the number of characters that will be displayed on a single line.

Typically, computer character generators use either a 5 by 7 or 7 by 9 character format. This means that each character is generated from a matrix of pixels: five pixels across and seven pixels down for a 5 by 7 character format. There's a complex formula that engineers use to determine the best bandwidth; however, here are a few that are commonly used with personal computers:

40-column display with 5 by 7 format = 2.8 MHz

40-column display with 7 by 9 format = 4.5 MHz

80-column display with 5 by 7 format = 5.6 MHz

80-column display with 7 by 9 format = 9.0 MHz

**Q:** I'm forever hearing stories of how some people are becoming millionaires overnight by using their personal computer. This is hard to believe. Are any of these stories true?

**A:** Maybe not overnight, but there have been many instances of someone who has turned a hobby into a sizable business.

One of the many examples is Howard Gosman who started H&E Computronics. He started in one room of his house with a personal computer he originally purchased to develop a horse racing system as a hobby. He discovered others with a similar interest and began to publish a newsletter about computers and horse racing.

Gosman didn't stop there. He realized that no one was offering software with a 30-day money back guarantee—so he bought software from manufacturers and offered the software for sale with his own guarantee to his subscribers. After that venture took off Gosman published his first software catalog. He quit his full-time teaching job and moved his business into rented office space.

Gosman has recently published his 14th software catalog which runs 64 pages. He has also begun to develop his own software products. From a humble one-man operation, Gosman's company now employs 34 people, including nine full-time programmers.

**Q:** Should a potential buyer ask for user references when evaluating software?

**A:** Although user references don't hurt, they generally don't help the customer much, says Mark Aschauer of the Mission Computer Centers (located in Northern California). They do help the salesperson, however, because he will provide only the names of satisfied customers.

User references are probably more valuable for the chance they provide to evaluate a dealer's after-sales support. A dealer who furnishes user references is probably someone who provides good follow-through service.

**Q:** I have a Commodore 64, which I use mostly for word processing. It works just fine except for one thing: The screen shows only 40 columns, although text will be printed in 80 columns. I'd rather not start adding hardware, so can you tell me if there's any word processing package for the Commodore 64 which will display 80 characters on the screen without the need for hardware?

**A:** Mike Reinhold of Mirage Concepts in Fresno, Calif. says the Mirage Word Processor for the Commodore 64 will produce an 80-column display without the need to add hardware to your system.

Retailing for \$99.95, the Mirage Word Processor actually has two programs on the disk: One displays text in 40 columns, and the other displays text in 80 columns. You can switch between programs with an F8 key-stroke command. This is useful if you want to work in 40 columns, but want



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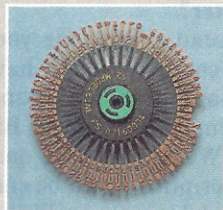
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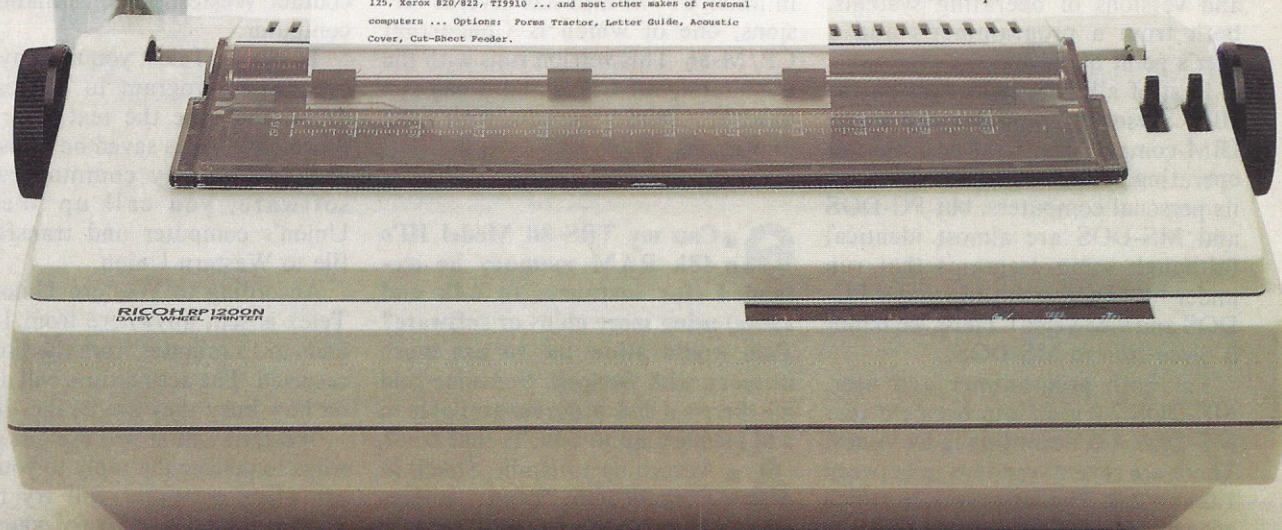
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to see what it will look like in 80 columns at some point in your work.

Reinhold does recommend the use of a monitor with your 64 rather than a TV set if you're going to work in 80 columns. The reason for this is that the image will be practically unreadable on your TV screen, while a monitor has the resolution needed to make clear, readable characters.

**Q:** I have recently become involved in personal computing and I'm confused about the various operating systems. For instance, what is the meaning of and difference between MS-DOS 1.0, 2.0 and CP/M?

**A:** An operating system is the control system for running software in your computer. Operating systems handle input/output, assign storage locations, compile and do other things, most of which are invisible to a computer user.

According to Chris DeVoney, author of *PC-DOS User's Guide* and vice president of Que Corporation in Indianapolis, Ind., your choice of an operating system depends on "whatever the software you want to use runs under." However, there are differences between operating systems and versions of operating systems, both from a programmer's and a user's point of view.

First of all, MS-DOS runs on the IBM Personal Computer and many IBM-compatibles. IBM has its own operating system called PC-DOS for its personal computers, but PC-DOS and MS-DOS are almost identical (although some programs that run under MS-DOS won't run under PC-DOS and vice-versa). Here, we'll limit discussion to MS-DOS.

For both programmer and user, MS-DOS 2.0 is an improvement over MS-DOS 1.0, according to DeVoney. There are several versions in between 1.0 and 2.0. The latest is 1.26 which accommodates double-sided disks.

At version 2.0 "a whole new variety of features were added," says

DeVoney. Features of the Xenix operating system were incorporated. For programmers this meant the opportunity to do more and "get more adept at things," says DeVoney. For the user, this means: Programs that have more features, better control of disk drives and the ability to handle peripheral devices not supported by the computer manufacturer. In regard to storage using version 2.0 "The user has the ability to create and use very large files and organize things a little more naturally," DeVoney says.

The only real disadvantage in using version 2.0 is that it takes 12k to 14k more of RAM than version 1.0 resulting in the loss of computer memory when it is booted.

"Given a choice between versions one and two, I'd go with two," says DeVoney. Note that later versions of operating systems are intended to be improvements over what came before. Another key is that you don't lose the use of most programs written for the various 1.0 systems because 2.0 systems will run almost all programs designed for 1.0.

As for CP/M, MS-DOS is "a somewhat faster operating system than CP/M," says DeVoney. Keep in mind CP/M also has several versions, one of which is Concurrent CP/M-86. This version runs with the 8086 family of CPUs and it can run most MS-DOS programs, with some limitations.

**Q:** Can my TRS-80 Model III's 48k RAM memory be extended (for instance, to 64k and above) using more chips or software? This would allow me to use more memory with Scripsit. Someone told me there's a disk program available to add memory up to 64k. Is that true?

**A:** According to Radio Shack in Fort Worth, Texas, unless you're a "hardware hacker," there is no way to increase memory to 64k in the Model III. That's because there

are no sockets in the machine for extra RAM and you would have to take out the 16k of ROM to make room. Nor can any disk program, by itself, increase the RAM of the machine.

If you're intent on increasing memory, Radio Shack recommends having the Model III upgraded to a Model 4. For this, you would need to buy an upgrade kit (\$795 retail), which requires installation.

**Q:** I've noticed that many companies use a Telex number as an additional address. Is it possible to contact these companies using my personal computer?

**A:** Yes. To send a Telex via your personal computer you'll have to subscribe to Western Union's EasyLink System. According to Bill Heinemann of Western Union, once you have a subscription you'll be connected to Western Union's worldwide Telex system.

For about \$40 a month (plus a charge for the Telex itself, which varies depending on the length and destination of the Telex), Western Union will give you your own Telex address, a password and a toll-free phone number which you can use to contact Western Union's mainframe computer.

To send a Telex, you use any word processing program to address the Telex and type the text. The word processing file is saved on a disk and then, using any communications software, you call up Western Union's computer and transfer the file to Western Union.

According to Western Union, the Telex is sent anywhere from 15 seconds to 15 minutes from the time it is received. The actual time will depend on how busy they are at the time.

Western Union will use one of two ways to deliver the reply to your Telex: Their computer will try to call your computer directly (of course you must leave your computer in the call waiting mode) or Western Union will



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**Q.** I am a doctor who wants to hook up to the Dialog data bases to do medical research. Is it worthwhile to spend the extra money to get a 1200-baud modem, or will a 300-baud modem suffice?

**A.** You can get by with a 300-baud modem, but if you plan to do extensive research, the 1200-baud modem will more than pay for itself by cutting down your on-line time to the data base, according to Dr. Rodney Bryant of Woodbury, Tennessee.

A 1200-baud modem costs around \$500, or roughly twice as much as a 300-baud modem, but the 1200-baud modem transmits data four times faster. When access to some data bases can cost one to two dollars per minute, you'll more than recoup your up-front costs in the long run.

**Q.** I am a fairly competent user of various types of software. But when it comes to the inner workings of a computer, I know absolutely nothing. That's my disclaimer in case this question is off base.

I have a CP/M-based Sanyo MBC-100 computer. At work we have converted to IBM XT's. Is it possible to change the operating system in my Sanyo to make it IBM-compatible? If so, how?

**A.** Chris DeVoney, author of *PC-DOS User's Guide*, says there is no way to do it since the Sanyo MBC-100 has no 8086 family co-processor available for it.

A co-processor or CPU in the 8086 family of processors will let you run

Concurrent CP/M-86. You can run most MS-DOS programs under the Concurrent CP/M-86 operating system. The MS-DOS operating system runs on the IBM and most IBM-compatibles.

If, however, you use MS-DOS 2.0 and make use of hierarchical directories for large files, you will run into problems trying to do this with Concurrent CP/M-86, says DeVoney.

With Concurrent CP/M-86, you can create one file as large as 8 Mbytes, then you have to start assigning phantom disk drives for more data. With MS-DOS 2.0, the file can be as large as the capacity of your drive, so it's easier to store and organize files on hard disk with MS-DOS 2.0.

DeVoney reminds us to always be wary of claims of full compatibility for both hardware and software.

**Q.** I've just started to learn to program my Apple II Plus personal computer. I've heard that to make an acceptable graphics program you have to program in Assembly language. How do I go about learning Assembly language?

**A.** Programs that use top-quality computer graphics are mostly associated with computer animation. This is where the computer displays a series of picture elements creating the illusion of motion. For the illusion to be successful, picture elements must be positioned and repositioned on the screen fast. The most efficient computer language for graphics is Assembly language. Unfortunately some programmers who are familiar with BASIC find Assembly language a little abstract to learn.

According to a spokesperson for Penguin Software of Geneva, Ill., you can use their software package, The Graphics Magician, to create your own professional quality computer game. In fact, The Graphics Magician is used to create software produced by companies such as

Mattel Electronics, Milton Bradley, Adventure International and Sierra On-Line.

The Graphics Magician consists of several programs: a shapes editor, path editor and animation editor. The shapes editor enables you to easily draw objects on the screen without having to program a single line. Once the object is drawn, you use the path editor to define the path the object is to follow on the screen. Finally, the animation editor helps pull the picture elements together into the product.

**Q.** When I bought my Apple IIe I paid extra for an 80-column card which I understood would give me more than the standard 64k memory. In fact I understood memory would double to 128k. I bought my Apple mostly for its use as a word processor, which, incidentally, does me great service. After adding my AppleWriter software, my data line tells me I have 46,485 characters of storage left. What happened to the 128k I paid for?

**A.** If you use the 80-column card and AppleWriter, what you see is what you get. That is, you have 46k of memory left. The reason for this "has to do both with the way the AppleWriter was written and the way the 80-column extended memory works," according to John Morand of the Appleseed User's Group in Worcester, Massachusetts. "That 64k is not just sitting there waiting to be used." The program takes up most of that extra memory.

Normally on the IIe with 64k of memory, booting AppleWriter leaves you with 27k of memory for files. Though the 80-column card technically adds 64k of memory to the IIe, you actually get only 19k of that extra 64k for files. So with an 80-column card added and AppleWriter booted, you get a total of 46k for files instead of the 27k with AppleWriter booted and no 80-column card.





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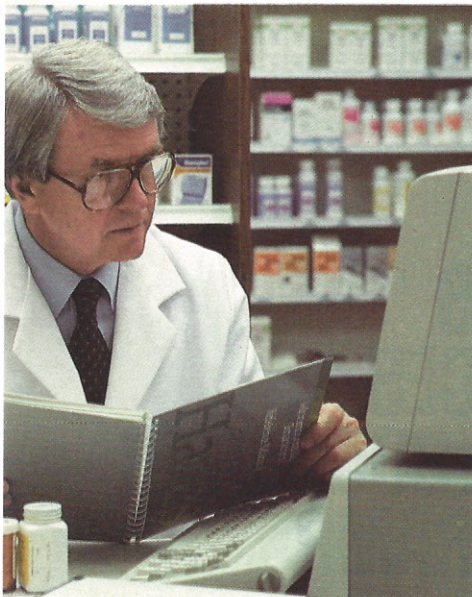
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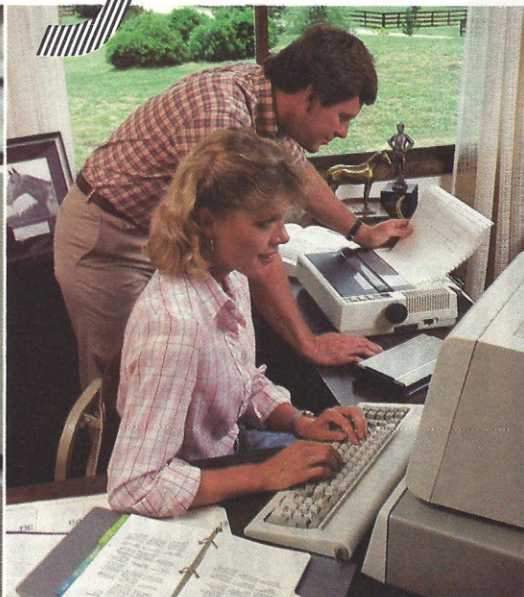
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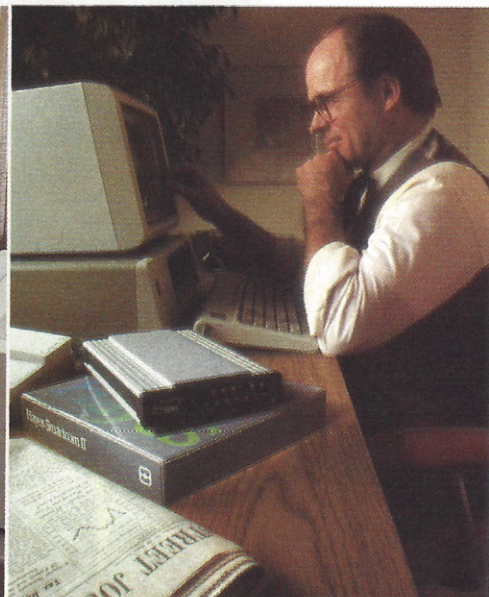
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If you need it, there's always "help." This feature explains prompts, messages, etc. to make communicating extra easy.

With Smartcom II, it is. Case in point. Before you communicate with another system, you need to "set up" your computer to match the way the remote system transmits data. With Smartcom II, you do this only once. After that, parameters for 25 different remote systems are stored in a directory on Smartcom II.

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Smartcom II communications software.

NOTE: Smartmodem 1200B may also be installed in the IBM Personal Computer XT or the Expansion Unit.

In those units, another board installed in the slot to the immediate right of the Smartmodem 1200B may not clear the modem; also, the brackets may not fit properly. If this occurs, the slot to the right of the modem should be left empty.

And, in addition to the IBM PC, Smartcom II is also available for the IBM Personal Computer XT, COMPAQ Portable, Corona Portable PC, Columbia MPC, DEC Rainbow 100, Xerox 820-II, and Kaypro II personal computers.\*

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## ANSWERS

**Q:** I own an Apple IIe and am totally pleased with it. However, one thing puzzles me. I have found no use for the up and down arrow keys and it seems to mess up what I'm doing when I try to use them. When can I use the up and down arrow keys?

**A:** The up and down arrow keys are useless with most software originally written for the Apple II series and now used on the IIe. John Morand of the Appleseed User's Group in Worcester, Mass., explains that some software written especially for the IIe, such as Apple's own AppleWriter IIe and Quick File IIe, will use the up and down arrow keys for cursor control.

In the IIe's operating system, the default value for the down arrow key translates to a line feed function; the up key value translates into a vertical tab. This is why they may seem to "mess up things" when you try to use them because some software may not "lock out" these values, as Morand says.

"Generally, a good program should look for certain characters it won't accept and will disallow those values," Morand says. If the program does not lock out the values for line feed and vertical tab coming from these two keys, you will have problems if you try to use the keys because the program may try to execute a line feed or vertical tab. In short, don't use the up and down arrow keys unless you have a program specifically designed to translate those up and down arrow key values into up and down cursor movement.

For those who like to devise their own application programs, there is a way to make these keys control the up and down movement of the cursor. Using the Pascal Operating System for the Apple II, you can reconfigure the values assigned to these keys.

Within the files on the Pascal Operating System disk you will see one called Setup. Select P to ask for prompting values, which will let you

see and change values for different field names. Here are the values you change: "Field name = key to delete character" should have a value of 8; "... key to move cursor left" should be 8; "... key to move cursor down"—78; "... key to move cursor right"—21; "... key to move cursor up"—11; "... move cursor right"—28; "... move cursor up"—31.

After changing the appropriate values to what they should be, select Quit and save the changes in memory. Morand recommends testing the new values with the text editor before saving them to the Pascal disk. If your up and down arrow keys control the up and down cursor movement you've got it.

Morand points out that this procedure will only work with programs written in Pascal and that run under the Pascal Operating System. So after making the above changes to your Pascal disk, you would then have to write applications in Pascal that will tap into these values while the computer is under the Pascal Operating System.

The only way you could change existing software to include up and down cursor movement is if that software is not write-protected. Even then it would be difficult to do.

**Q:** I recently read your special report on Apple's new Macintosh computer and was interested in finding out if one can actually program the computer or if the computer only functions with special software one must buy in order to use its features.

**A:** Users can program on the Macintosh. According to John Morand of the Appleseed User's Group in Worcester, Mass., there will soon be a BASIC language, as well as Pascal and a 68000 Assembler in June. These will let you program on the Macintosh.

Morand points out, however, that some "fancy stuff" like windowing and sharing data between applica-



tions must be programmed using Lisa and then transposed for use on the Mac. You can't take advantage of very many of the Macintosh's features in your software by programming with the Mac, although you can use some and Morand says most applications work fine.

**Q:** What is the difference between static and dynamic RAM (Random Access Memory) and which is better?

**A:** Both static and dynamic RAM are memory chips contained in personal computers. You'll find that static RAM is used more in older computers and is frequently found in expanded memory boards

such as the Z80 card, according to Bill Rea, an engineer for Videx, a leading manufacturer of memory expansion devices.

The reason manufacturers are turning their attention away from static and more towards dynamic RAM is the desire to conserve power, Rea says. Static RAM is faster than dynamic RAM and uses more power because it has to be under constant power to retain data. Dynamic RAM, on the other hand, retains data and only needs to be recharged with power every fraction of a second. Dynamic RAM also allows the designer to store more information in a smaller space than could be achieved using static RAM. Dynamic RAM chips are perfect for smaller, more

powerful personal computers because they consume less power and condense memory space.

Which one is the best? If you're looking for fast information processing and power is not a constraint, then static RAM might edge out dynamic RAM. But for general purpose use the benefits of dynamic RAM seem to outweigh any drawbacks that are present when using dynamic RAM.

But the consumer has practically no choice. The personal computer you purchase will have one or the other and you can do very little to change it.

**Q:** I have an Apple IIe system that operates on a 110 volt AC, 50/60 Hz power supply. What's the easiest way to adapt my system for use overseas on a 220 volt AC, 50 Hz power supply?

**A:** You have two considerations, says Rick Hyde, a member of Apple's intercontinental service department. The first is power, which can be solved with the addition of a simple transformer that converts the 220 volts of AC power to 110 volts. It should cost about \$15. You can buy one at any electronic supply store.

The computer and just about all peripherals imaginable will draw no more than 200 watts, Hyde says. So buying a transformer rated at 500 watts or more will provide more than adequate protection against overheating.

Make sure you buy a true transformer not just a power converter. If you only use a converter there's a chance you'll end up with a computer system whose insides are literally "fried," Hyde says.

As for peripherals: Any peripheral Apple makes will work overseas (with the transformer), as will peripherals of other brands *that draw power straight from the Apple*. But if you plan to take along peripherals not made by Apple *that plug directly in-*

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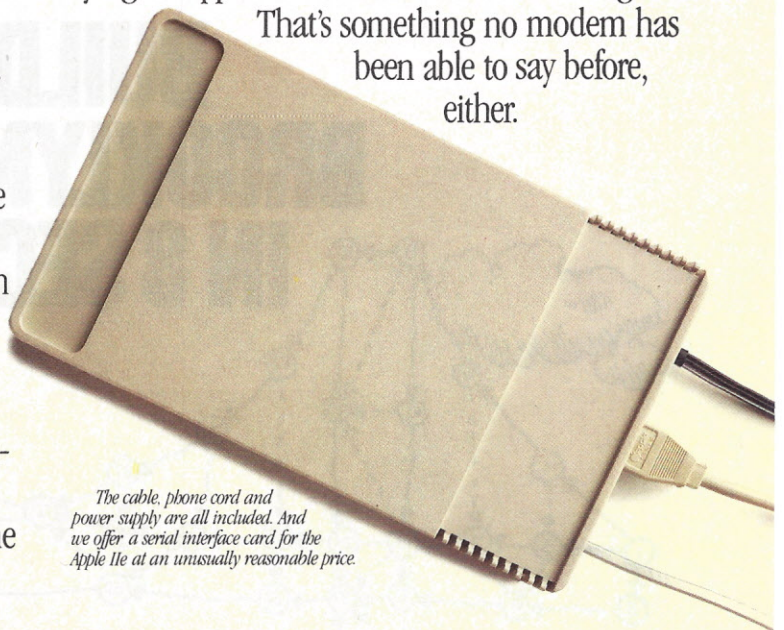
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to the wall, you'll need to contact the manufacturer of that device to see if additional precautions are necessary.

Your second problem is video. The U.S. video system, NTSC, is significantly different from the PAL system in use in Europe, Hyde says. Therefore, an Apple manufactured in America and taken to Europe will not work with a European television or monitor (and vice versa). You must take an appropriate television or monitor with you. Most parts of the world, Hyde adds, use the European video standards.

You might want to consider the warranty restrictions for any equipment taken out of the country. Apple's warranty is valid only in the country of purchase.

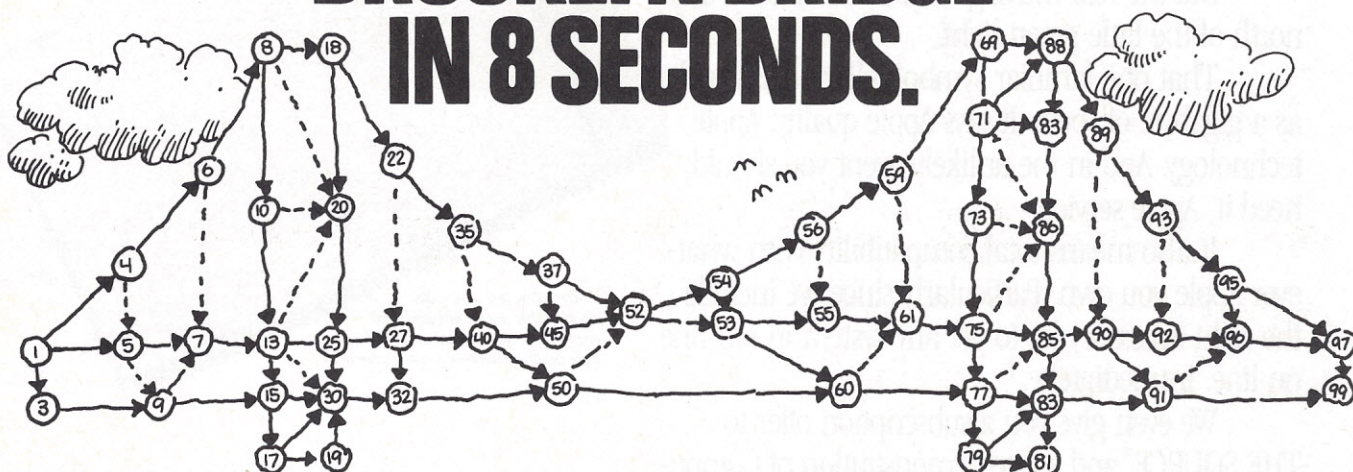
**Q:** I own a small retail store and would like to use a personal computer to help manage my business. What I'm looking for is something similar to computers used by major chain stores. I'd like to use the computer as the cash register and have the computer keep track of all the activity in the store. Do you know how this can be accomplished?

**A:** You'll need a personal computer with a disk drive, a receipt printer, a cash draw and point of purchase software or, if you know how to program the computer yourself, you can design your own software. According to Armon Mesker of NCR Corporation, his company offers equipment that will get you up and running in a short time.

NCR Corp. has a retail grouping of equipment that can be added to the NCR Personal Computer. In this grouping you'll find the cash draw, a receipt printer, an 80-column printer and two software packages: Point of Sale and Inventory Management. Mesker also suggests a hard disk if you have a large volume of sales. The whole package including the computer can cost close to \$7000.

Mesker says that NCR is planning to sell the equipment separately, so you can purchase the cash draw and the receipt printer without having to purchase the other equipment. This can be a savings since together the draw and the printer sell for about \$500. The cash draw operates from a standard RS-232-C circuit board and

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the printer connects to your computer using a parallel interface. You can use this with almost any personal computer.

The only drawback to this whole system is that the software is not transportable so if you are not going to use the NCR Personal Computer, you'll have to track down or develop your own point of purchase software.

**Q:** Do the \$10 or \$15 surge protector models give the same protection as the more expensive models?

**A:** Absolutely not, says David Sutton, president of Sutton Designs, Inc. of Ithaca, N.Y., makers of surge protection devices. To un-

derstand why, first you'll need some background.

The U.S. standard for AC is 120 volts. A voltage spike, which is a short jump of high voltage that lasts only microseconds, can shoot the voltage all the way up to 9000 volts, Sutton says. Spikes can occur many times a day. Power surges can also come in over the lines. A surge is a longer lasting but lower voltage spike.

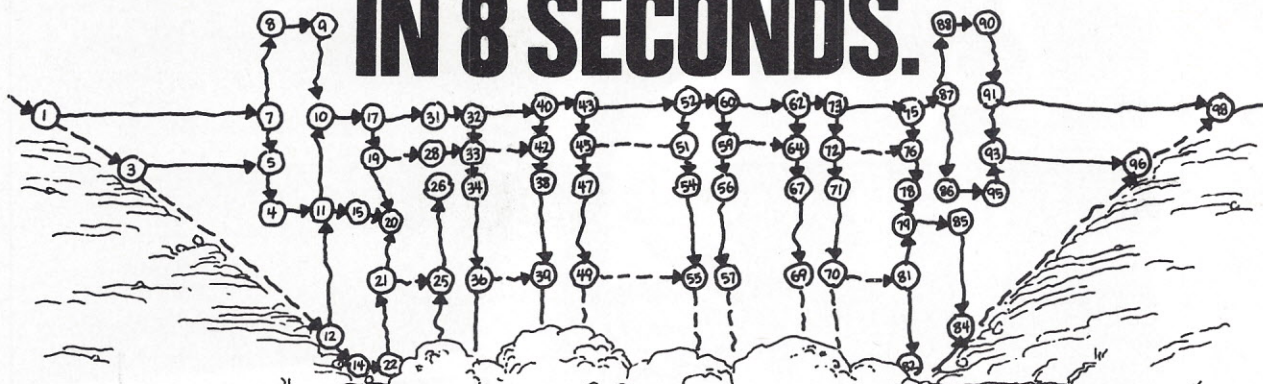
The purpose of a surge and spike suppressor, Sutton says, "is to prevent that surge from hitting the computer, the computer's accessories and, above all, from hitting the software. The faster a surge protector responds and the higher the voltage it can handle, the better it is.

"The surge protectors in the \$10 to \$15 range are very limited in the amount of voltage spikes they can handle," Sutton says. "The inexpensive models, at the very most, use early 1970s technology and may protect against a spike of one to 2000 volts. Also, they generally cannot take a surge."

Even surge suppressors that run from \$39 to \$89 "have to shortcut something in order to be able to produce and operate at a profit," Sutton says. "The compromise is usually using the older technology, which is capable of handling less of a voltage spike and surge and is also slower in its response to 'seeing' that surge. It takes longer for it to clamp it," he

(continued on page 196)

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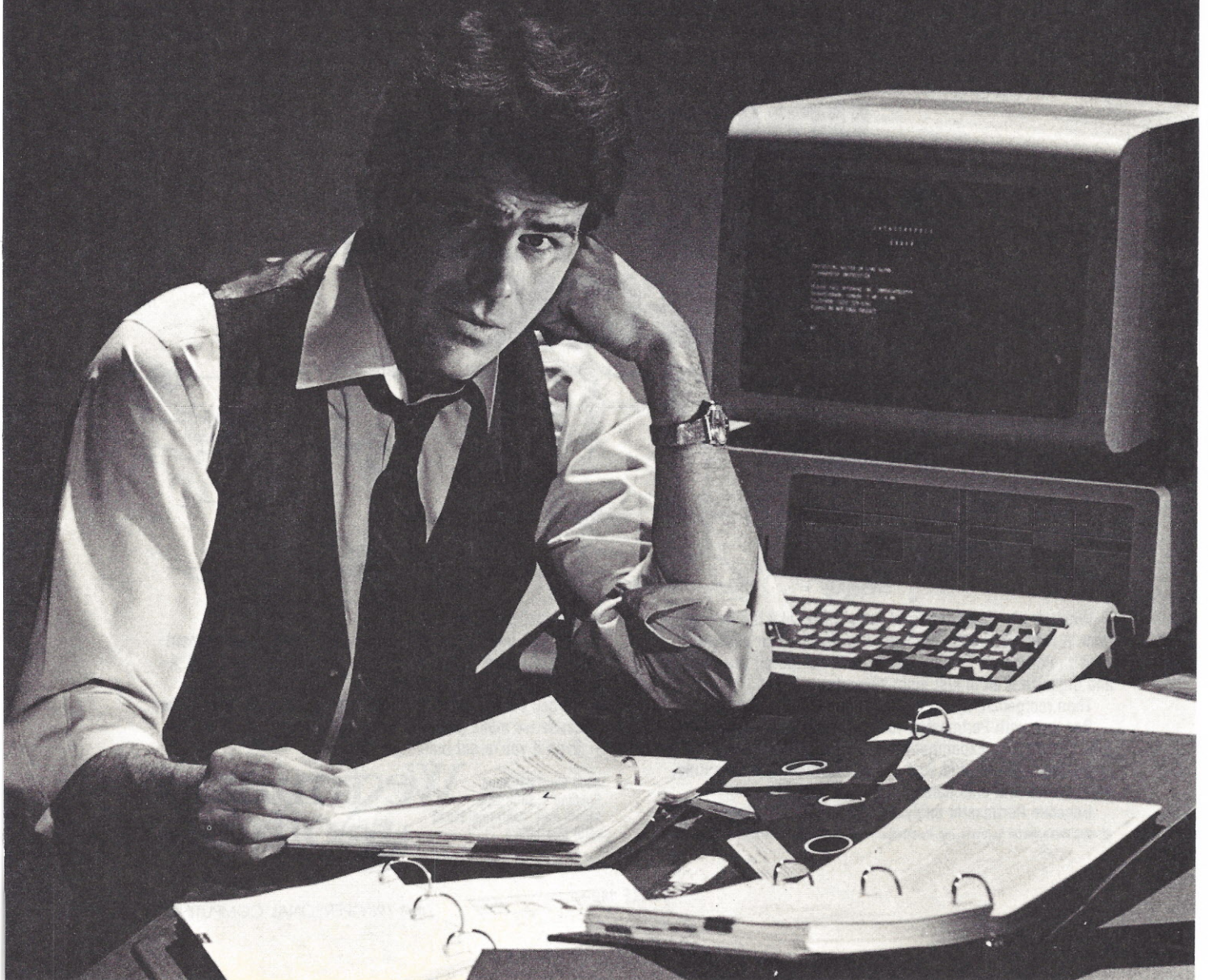
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## Software Digest RATINGS NEWSLETTER

Vol. 1, No. 1 January 1984

### INTRODUCING A NEW AND MORE RELIABLE WAY TO EVALUATE SOFTWARE

Software Digest has developed an innovative method for rating software. Instead of depending on only one reviewer's opinion, each program is put through the same series of tests by ten different reviewers with varied levels of experience. The conclusions are averaged. The tests are standardized and uniformly applied. The reviewers' scores are averaged to further reduce the possibility of bias. And the ratings are calculated by formulae, as explained in detail on Page 6.

Combining the test results and opinions of ten reviewers in this manner is inherently better than relying on one opinion, and every effort has been made to insure accuracy. It must be noted, however, that no evaluations involving human judgment should be interpreted as statements of absolute fact. In this, our first issue, we report the results of our testing of 30 word processing programs. And we do it with a minimum of words. Because the results speak for themselves.

### IBM PC Word Processing Programs

Software Digest Rating		Over-all Evaluation	Program Name		Ease of Start-Up	Ease of Learning	Error Handling	Versatility	Value for Money	Memory Required	Spelling/Correction Included	Page
****	8.1	Phy-Write							128K \$140	✓	14	
****	8.1	Volkswriter Deluxe							128K \$285	✓	19	
****	8.1	OfficeWriter							128K \$325	✓	12	
****	8.0	ViewWord Plus							128K \$375	✓	18	
****	7.6	Sanna Word II							192K \$450	✓	15	
****	7.5	Einsteiner							128K \$300	✓	8	
****	7.2	Leading Edge							256K \$295	✓	10	
****	7.0	MultiMate							192K \$495	✓	11	
****	6.7	WordVision							96K \$ 80	✓	21	
****	6.5	SuperWriter							64K \$295	✓	17	
****	6.4	Texta							128K \$ 95	✓	18	
****	6.4	PeachTree 5000							128K \$395	✓	13	
****	6.3	Electric Pencil PC							48K \$300	✓	15	
****	6.3	Electric Pencil PC							64K \$325	✓	9	
****	6.0	Qwerty							64K \$395	✓	12	
****	5.9	Palantir							128K \$295	✓	16	
****	5.8	Select							64K \$295	✓	19	
****	5.8	WordPerfect							128K \$495	✓	17	
****	5.7	EasyWriter 1.10							64K \$175	✓	19	
****	5.7	Super-Text							64K \$175	✓	17	
****	5.5	EasyWriter II							64K \$350	✓	8	
****	5.5	WordPlus PC							128K \$375	✓	11	
****	5.3	Microsoft Word							192K \$495	✓	20	
****	5.0	Benchmark							128K \$375	✓	10	
****	5.0	Benchmark							64K \$500	✓	7	
****	4.9	MegaWriter							64K \$100	✓	10	
****	4.8	WordStar							64K \$495	✓	20	
****	4.8	WordStar							64K \$195	✓	21	
****	4.6	xyWrite II							48K \$495	✓	13	
****	4.6	Spellbinder							128K \$349	✓	11	
****	4.4	Perfect Writer							128K \$349	✓	11	
****	3.9	FinalWord							64K \$300	✓	9	
****	3.5	PowerText							128K \$475	✓	14	

### Ratings Key

(On a scale of 0 to 10. For methodology, see Page 11)

**OVERALL EVALUATION**

\*\*\*\*\* 9.0 or higher  
\*\*\*\* 8.0-8.9  
\*\*\* 7.0-7.9  
\*\* 6.0-6.9  
\* 5.0-5.9

**ALL OTHER RATINGS**

7.0-9.9  
5.0-6.9  
Under 5.0

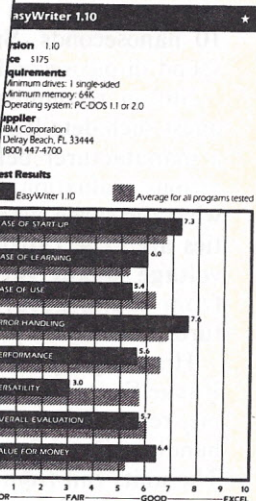
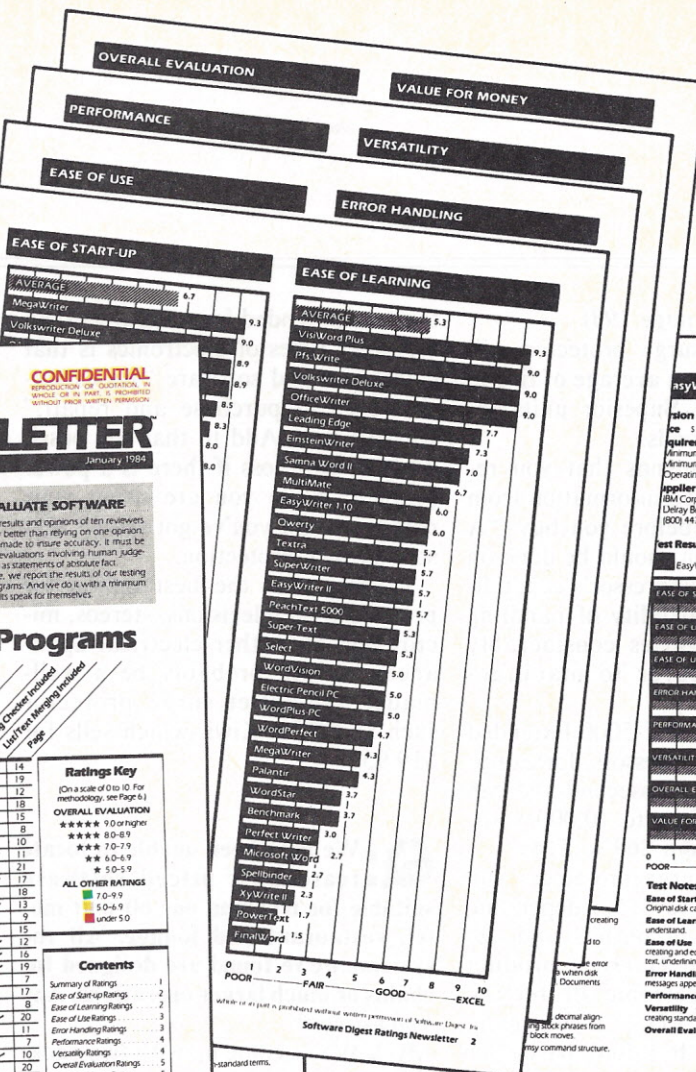
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Value for Money Ratings  
Teasing Procedures  
Individual Program Reviews  
Other Publications  
Future Issues

**Ratings Key**  
(On a scale of 0 to 10, 10 being the best)  
\*\*\*\* 8.0 or higher  
\*\*\* 7.0-7.9  
\*\* 6.0-6.9  
\* 5.0-5.9  
ALL OTHER RATINGS  
7.0-9.9  
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**Test Notes**  
**Ease of Start-Up:** Clear, step-by-step installation instructions in manual. Original disk can be copied once.  
**Ease of Learning:** Manual and tutorial are well written and easy to understand.  
**Ease of Use:** Formatting with embedded commands slows process of creating and editing text. Basic editing operations, such as moving blocks of text, underlining, and setting indents and tabs, are difficult to execute.  
**Error Handling:** When incorrect commands are entered, specific error messages appear and beep tone sounds.  
**Performance:** Fair speed of execution. Text alignment is slow.  
**Versatility:** Capabilities include inserting stock phrases from disk file and creating standard ASCII files.  
**Overall Evaluation:** Easy to learn but difficult to use.

If you're an IBM PC user, or are about to become one, the fastest way to find the programs that *really* are easy to use is to subscribe to the Software Digest Ratings Newsletter.

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SVSU



(continued from page 193)

says. A good surge protector will clamp a spike in an average of five to 10 nanoseconds. Superior units respond in picoseconds.

Sutton recommends that you request such detailed information from a manufacturer before you buy. "A serious evaluation should be done on what the surge suppressor's capabilities are. The capability of handling voltage spikes varies considerably from manufacturer to manufacturer," he says.

His company's ZX-5000 Extended Range Surge Suppressors, for example, react in one picosecond and can handle spikes of up to 10,000 volts. The units run from \$69 to \$149.

"Most good surge protectors will range from \$50 to \$150, depending on the number of outlets and options," says Jim Garrity, product support for Electronic Protection Devices, Inc. (EPD), of Waltham, Massachusetts. "But don't base your decision to purchase surge protection on price alone. Rather, you should look for the length and type of warranty and the reputation of the manufacturer. Beware of copycats and fly-by-night companies. Low pricing may result in unhonored warranties or problems down the road."

**Q.** Why aren't surge protectors pushed as needed protection for other electronic components such as televisions, stereos or even microwave ovens? Wouldn't the same unit protect them, too?

**A.** "It sure would," says Jim Garrity, product support for Electronic Protection Devices (EPD), manufacturers of surge protectors. "If one's refrigerator and microwave are on the same outlet, there may be problems with overcooking. A surge protector would protect against that. Folks who live in areas where they get lots of lightning often put surge protectors on their televisions."

The reason such units are more of-

ten recommended for computers than for other types of electronics is that computers and software "are expensive both to purchase and repair," Garrity says. Add to that the possibility of data loss if there is a power problem while you are using your computer and you've got strong reasons to seek protection.

Garrity says the best option for protection on televisions, stereos, microwaves and other electrical appliances "would probably be a well-made, one-outlet surge protector such as EPD's Kiwi, which sells for \$19.95."

**Q.** We have been unable to locate reasonably priced software suitable for tracking our 60-unit motel, restaurant and lounge. All the systems we've found are designed for chains or much larger operations. Any suggestions?

**A.** We've come up with two packages that may suit your needs. The first, Front Desk, is defined as a "front-end reservation system." The second, The Night Auditor, is a back-office program which performs hotel accounting.

Front Desk, made by Hansen Management Systems in Kihei, Hawaii, costs \$1495 and is made for smaller operations such as yours. It is a menu-driven reservation system written in dBASE II which provides you with occupancy and management reports. It books the reservations, does guest confirmations, tracks deposits, gives guest statements upon departure and allows you to view all the reservations by date and type of reservation. It also does occupancy forecasts, arrival and departure reports. It will even provide automatic unit selection, where the computer will pick out the rooms with twin beds, ocean view, etc. It also lets you have a different rate for every unit, says Paul Hansen, president of Hansen Management Systems.

The program runs on CP/M-80, CP/M-86, MS-DOS and PC-DOS. For more information, write to: Hansen Management Systems Inc., P.O. Box 688, Kihei, HI 96753 or phone (808) 879-9943. A demonstration disk and manual are available for \$50.

The Night Auditor costs \$625 for the floppy-disk version and \$725 for hard disk. The program, from Santa Fe Software, does three things: provides an account summary of the hotel's business for the day; provides an accounts receivable report; and compiles a cash balance for the day's business.

The first report, account summary, allows the hotel management to accurately monitor cash flow in areas such as revenues, taxes and reimbursements. The second, accounts receivable, gives details of charges, cash received, expenses and credit card charges. The third, cash balance, provides a check of the cash on hand after a day's business. The hard disk version will also do monthly reports.

For more information, contact: Michael Mandell, Santa Fe Software, 1107 Early Street, Santa Fe, NM, 87501 or phone (505) 982-2367. This program is for any computer that runs dBASE II.

**Q.** In your December "Answers" column you advised keeping the disk drive door closed at all times to reduce dust. But I've heard that you should keep the door open when it's not being used since closing it locks the drive head and puts pressure on it. Which is the right way?

**A.** According to Don Burtis, head of Rana Research for Rana Systems, keeping the disk drive door closed is "absolutely necessary" to guard against dust which can destroy data. If you have double-sided disk drives, he suggests inserting a diskette that you no longer need or that has been damaged into the drive and



leaving it there with the door shut when the drive is not in use, thus protecting the drive heads.

If you shut the door without a disk inserted, double-sided disk drive heads will rub together. With single-sided disk drives, you won't have that problem and can simply shut the empty drive's door when not in use.

When disk drives are shipped, there is usually a piece of cardboard, shaped like a diskette, inserted into the drive to protect it, Burtis says. If you wish, the cardboard can be saved and used to protect the drive heads.

**Q:** I keep hearing that you should look at software before you shop for a computer, but how do you do this if you don't know enough about how computers work to run the software?

**A:** The best way to learn how a computer works is to run some software on one. According to Herb and Marion Blechman, owner/managers of the Softwaire Center in Concord, Calif., a lot of people are visiting software stores these days to see what kinds of software are available. These stores have computers available to run the software, and the salespeople will assist you in running it until you're comfortable. Another plus is that most software stores carry a wide assortment of books about computers, and you can pick up some good, basic, introductory literature to take home after you've test-run some software.

**Q:** Computer technology seems to advance every hour, and I'm concerned about spending a lot of money for a machine that becomes obsolete in a year.

**A:** Steve Laff of Friendly Computers in Santa Monica, Calif. says that few people would deny that computer technology is changing rapidly. But if you need a computer and are waiting for the ultimate ma-

chine, you will be doing a lot of waiting and missing out on the productivity improvements and pleasure a computer can provide right now. Find a computer that saves you time and you're ahead of the game. You don't need the most advanced computer, but rather one that can do the job for you now, and will continue to do the job. The wisest choice would be one that seems likely to be around for a while.

**Q:** I want to buy a monitor. Should I buy one that's monochrome or color?

**A:** Dave McKnelly, who manages the Dover, Del., ComputerLand, says it all depends on what

you're using the computer for. If you're using it for number crunching and word processing, then the monochrome display is the best way to go. It's generally sharper, and easier on the eyes over long stretches of usage. Of course, if you're using the computer for games and graphics presentations, then the color monitor is the best (albeit more expensive) way to go. For home use, it makes a lot of sense to get an RF adapter and use your color TV when you want to use "colorful" software, and buy a monochrome monitor for most productivity-oriented applications.

For office use, there are very expensive (upwards of \$500) color monitors suitable for general purpose use. But not every computer can run one

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of these monitors, which require what's known as an RGB (Red-Green-Blue) signal. And even an ordinary RGB monitor won't do for true general purpose use. It must be one of the high-resolution types, with some form of glare reduction on the CRT's surface. But even with these, the resolution won't quite match that of a good \$200 (or so) monochrome display.

To decide, you should go to your dealer. See if he can set up a computer with both color and monochrome displays, showing the same display—preferably a screenful of text. Then start typing in some text. You'll soon know if the difference between the two monitors will make a substantial difference for you and what you want to do.

**Q.** I own an Atari 1200XL home computer, which has an RS-232 serial port. What are the advantages and disadvantages between the new Atari 1050 disk drive, DOS 3.0, and the Percom Data AT88 S1 PP which features a printer port and Atari's DOS? Is it fully Atari-compatible?

**A.** "I've had some situations selling Percom data disks that won't run Atari software," reports Glenn Miller, manager of Computer Scene in Miami, Florida. Although he admits Percom may have worked out the problems, he no longer sells the AT88s and recommends that you stay with Atari disk drives to assure full software compatibility.

**Q.** How can I prevent static in my office from damaging my computer equipment?

**A.** In computer environments, you'll often hear that "static is the enemy." Fortunately, says Neal Feldman, service manager at Quest Computers in Oakland, Calif., most components are protected today by plastic covers. "Static can blow up

your CPU," he says by way of warning, although he adds that it shouldn't be a problem because most people aren't likely to come into direct contact with this portion of the computer. However, as Feldman says, "It never hurts to be prepared."

One good thing to keep in mind is to make sure you never touch the media on your diskettes, lest static charge picked up from the carpet or air cause damage to your data. For another preventive approach, there are a number of companies which make products which help control static. These products range from sprays applied to carpets, floors and chairs, to anti-static floor mats.

**Q.** Some of my friends have told me that buying non-Apple disk drives for my Apple II will allow higher disk capacity. Is this true? More important, though, is it a good idea?

**A.** According to Dave Graham at Sun Computers of Huntington Beach, Calif., some of the alternate manufacturers' drives do provide more capacity—sometimes a great deal more. If you went to a hard disk you could put the capacity of literally dozens of Apple floppy drives online. Even some inexpensive floppy drives can increase drive capacity at least 20k.

But this has some disadvantages on the Apple. The operating system offered for several years—Apple DOS—has a very limited ability to deal with high disk capacities, and most application programs—for example, VisiCalc—are unable to access the larger-than-normal disk space. For a larger-size drive to work, you need to modify DOS to recognize the extra volume, and then use applications software that can work with the modified DOS. Such modification software comes with the drives.

But don't be discouraged. Graham believes Apple's announcement of ProDOS will be followed shortly by Apple making their hard disk drive

available for the Apple II line as well. When and if this happens, many commercial applications packages will be modified to use larger-capacity drives, making it more practical for those wishing to add storage capacity—even if they use an alternate maker's drive.

**Q.** I have an Atari 800 with one 810 Disk Drive, and I'd like to add another drive. Can I use the new 1050 Disk Drive with the 810? I've heard that the 1050 is double-density, and that makes me wonder whether it needs a different disk operating system than the 810.

**A.** The Atari 1050 Disk Drive can be used in conjunction with an 810, according to Glenn Miller, manager of Computer Scene in Miami, Florida. Miller says you can simply daisy-chain the two disk drives to the computer.

Miller explains, "The Atari operating system doesn't care whether the drives it uses are single- or double-density. It's simply a difference in the amount of storage between the two drives." A double-density drive, such as the 1050, has twice the storage capacity of a single-density drive (the 810).

**Q.** What do variable speed motors do for disk drives? This seems to be an increasingly popular feature on new floppy and hard disk units.

**A.** Variable speed motors increase the capacity of disk drives because of the way data is stored on diskettes, says Brad Roth, sales consultant at Infomax Computers in Walnut Creek, California.

To make the concept easy to understand, just think of a diskette as being like an audio record—the recording surface gets smaller as the drive head moves in toward the center of the disk, because the circumference of the disk gets smaller as you move in from its edge. With a con-



stant-speed motor, this means that the less area you have, the less storage capacity you have as the head moves in from the disk's edge. The inner part of the diskette moves past the head more quickly, and there's less time and space to store data.

A variable-speed disk drive motor, says Roth, equalizes the capacity of the diskette as the head moves toward the center by slowing down the rotation of the diskette. Because the rotation slows, the surface moves past the head more slowly and there's more time to record data. (This is the same reasoning behind audio or video tapes that record one or two hours—the higher-capacity tapes simply move past the head at half the speed.) Some variable-speed motors in disk drives these days are making it possible to almost double the storage space on diskettes.

**Q.** We're going to be moving our office from New York to Pennsylvania, and we're concerned about potential damage to our personal computers in transit. Do you have any suggestions for the safe transport of our machines?

**A.** There's a service that specializes in transport of computer equipment, including personal computers. Computer Express, from Sureway Air Traffic Corp., operates 24 hours a day, 365 days a year, and will ship worldwide.

Randy Catlin, executive vice-president of Sureway, says, "We research the needs of each customer before arranging for delivery, since we know how vital it is to keep computer equipment organized." Catlin says Sureway takes special care to systematically unlink equipment before packing and to reassemble it upon delivery.

For more information about Computer Express service, contact Sureway Air Traffic Corp., at 36-14 32nd St., Long Island City, NY 11106; (212) 937-7601.

**Q.** I read that it's possible to interchange DIF (Data Interchange Files created by VisiCalc) between Apple III's and IBM Personal Computers. However, no one has mentioned the specific hardware/software required. Would you describe how such an interchange can be accomplished?

**A.** According to Alpha Software Corp. (Burlington, Mass.), their Apple-IBM Connection package will do the trick, as long as you operate your Apple III in Apple II-emulation mode. First, you've got to convert your Apple III files to Apple II format (you can use the Apple Writer III utilities disk to do that), and then you just follow the instructions for an Apple II in the Apple-IBM Connection manual.

To actually accomplish the exchange, you'll have to either establish a modem link between the two computers or purchase Alpha's optional connecting cable that links the serial ports of your two computers.

**Q.** Is there an adapter or interface card that I can buy to plug into my DEC VT-180 to run Apple or IBM software?

**A.** Dealers, users groups, and other sources that we contacted didn't know of anything on the market at the time this magazine went to print.

Glenn Miller, manager of Computer Scene in Miami, Fla., says someone may soon have a board that allows the DEC VT-180 to run IBM software.

Miller points out, however, that DEC's VT-180 can read data files created on the IBM Personal Computer or XT via modem if you have the same package on both systems. For example, if you're creating data files on the IBM Personal Computer using that version of WordStar, you can modem those files to a DEC VT-180 running its version of WordStar and the DEC will read those files.

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# New Books On Computing

■ Artificial Intelligence In Education

■ The Joy Of Computers ■ The Intimate Machine

■ Real Managers Use Computers ■ Personal Computer Handbook

## Kids, Classrooms, and Computers

### LEARNING AND TEACHING WITH COMPUTERS: ARTIFICIAL INTELLIGENCE IN EDUCATION

TIM O'SHEA AND JOHN SELF  
PRENTICE-HALL, INC.  
ENGLEWOOD CLIFFS, NJ  
307 pp., \$12.95

It has long been recognized that computers are potentially the best thing to happen to education since the teacher. The computer can, for example, provide an individualized learning experience that moves at the student's pace; it doesn't have any social, racial, or authoritarian undertones to distract the student; and it doesn't embarrass the student in front of the class when he answers incorrectly. In fact, because the computer is an unthinking machine, the student can feel immediately capable of besting it.

But so far, the full potential of computers in education has barely been tapped, their use being restricted primarily to repetitive practice drills and concept reviews. For a computer to really be useful as a "teaching" device, say authors Tim O'Shea and John Self, it must be able to "answer unanticipated questions and to individualize teaching"—which requires the kind of flexibility and creativity that is being de-

veloped only in the realm of artificial intelligence.

*Learning and Teaching with Computers* is an introduction to both artificial intelligence and computer-assisted learning, which the authors advocate should be joined into one discipline. The authors also review the history and development of both areas, and discuss the implications they have for the future use of computers in the classroom.

They point out that computers are able to motivate students to learn (for some reason, many students put in extra time and effort when working with computers); that computers themselves are worthy of study as both a technological and sociological phenomenon; and that they allow students to practice organizing their knowledge in logical structures through programming, an activity that in some ways imitates the learning process.

The difficulties with using computers in the classroom, according to the authors, "lie in the fields of educational psychology, for we do not know enough about how students learn, and of artificial intelligence, for we must try to build computer programs able to use their expertise, to model students and to plan teaching strategies."

This book is written for the professional educator (not, it seems to me, for "all teachers and parents who wish to adapt quickly and successfully to the new opportunities created

by computer-assisted learning," as the cover blurb states), and is written in a style that draws heavily on contemporary educational theory. This includes the requisite acknowledgements to Jean Piaget, the Swiss psychologist: "Implicit in Piaget's work is the idea that children are intrinsically motivated to develop schemata through the processes of assimilation and accommodation. If there is a discrepancy between an informational input and a cognitive structure, the assimilation schema tries to return the structure to equilibrium."

When the authors' educational jargon meets that of the computer world, some interesting (and nearly indecipherable) sentences occur: "General purpose computers have only a small number of machine instructions and it is possible to associate each instruction with a distinct state of a byte."

The organization of the book is also hard to follow at times. The chapter called "Introduction" contains not only an overview of the authors' stated subject, but a tutorial on the Logo language and an introduction to different kinds of computer hardware.

All in all, this book should probably be required reading for any educator cum programmer who wants to work in the areas of computer-assisted learning and artificial intelligence, as the book is a good introduction to the state of both.

—Orlan Cannon



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## Everything You Ever Wanted To Know About. . .

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### THE JOY OF COMPUTERS

PETER LAURIE  
LITTLE, BROWN AND COMPANY  
BOSTON, MA  
191 pp., \$19.95

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**W**hile American publishers are coming out with more books on operating systems, languages, applications, and the IBM Personal Computer, British publishers have been producing intelligent, well-illustrated books on the computer phenomenon in general. Instead of being aimed at people who own a particular brand of computer or use a particular applications program, these books are meant for anyone who wants to learn more about computers in general—how they work, what they're made of, what they mean to daily life, and how to get the most out of them at home or in the office.

Peter Laurie's latest book is one of these. The editor of *Practical Computing* in Britain, Peter Laurie is well known as one of the authors of the BBC's best-selling *The Computer Book*. *The Joy of Computers* was first published in the U.K. by Hutchinson & Co., and was brought to the States by Little, Brown.

This is one of the true "computer literacy" books. It's not a technical book, but an illustrated Baedeker-type guidebook which includes a unique view of computers in the future.

The introductory section contains a very clear description of how computers and their various components actually work, from the simplest calculator watch to the most complex supercomputer. There are not only the usual blow-up pictures of chips that make them look like aerial photos of Los Angeles, but also the first understandable, illustrated

explanation of how layers of silicon form transistors in chips, and how those transistors work, that I've seen.

The section on programming begins with an introduction to the BASIC language and how programs are written. There are even seven complete BASIC programs (including a very long and complicated space adventure program called "Star Voyage") that can be entered and run on just about any personal computer that has BASIC. It is followed by a quick description of more esoteric programming techniques and anomalies ("hashing," "Zipf's Law," and "fractals," for example), and a description of structured programming. This is not a textbook—the technical points introduced here are presented so an average computer user will recognize the terms when he hears them, and will know what they apply to.

"Part Three—Professional Computing" (rather embarrassingly called "Part Two—Programming" again in my copy) is where the really impressive uses of computers appear. Simulations, graphics, computer-aided design, animation, robotics, and music are covered, with some really beautiful full-color illustrations and photos.

The design of the book by Bernard Higon is outstanding. The photographs and graphics are so stunning that I found myself saying, "How did they do that?" At times they seem to jump out at you and pull your attention into the text.

In describing the thought processes that led to the creation of the computer, Laurie points to the attitudes that for years kept any understanding of computers away from the general public. The computer world was for a long time ruled by two slogans: "Everything in the universe can be reduced to a meaningless string of symbols," and "Every process in the universe can be reduced to a meaningless string of symbols." As Laurie says, "Everyone who has got used to

computers has, consciously or unconsciously, absorbed these two propositions. They make it rather hard for the rest of the world to sympathize." Books like this one are a step toward making computer literacy possible for everyone.

—Orlan Cannon

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## The Social Challenge Of Computerization

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### THE INTIMATE MACHINE: CLOSE ENCOUNTERS WITH COMPUTERS AND ROBOTS

NEIL FRUDE  
NAL BOOKS, A DIV. OF THE  
NEW AMERICAN LIBRARY, INC.  
NEW YORK, NY  
224 pp., \$15.50

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**T**his subtle and surprising book, by a psychologist who has previously written about aggression and family relationships, treats the topic of artificial intelligence with welcome freshness.

How many stories have been told about ELIZA, the "computer therapist?" Written in the 1960s by Joseph Weizenbaum, the program recognizes key words in the user's statements and returns stock queries. It sometimes seems all tales about ELIZA stress how the program amazingly manages to mimic a real psychiatrist, deceiving the user into intimate confessions. So frightened was Weizenbaum by the hypnotic power of his primitive program that he has become one of the chief foes of substituting computers for humans in all such traditionally personal encounters.

Neil Frude convincingly shows that it's not the computer's fault—human beings will force perceived human qualities on the least likely artifacts. He recounts one of his own "disastrous" encounters with ELIZA:



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ELIZA: Do you often feel sad?

Frude: No.

ELIZA: Are you saying no just to be negative?

Frude: Not at all.

ELIZA: Please don't repeat yourself.

Frude: I'm not.

ELIZA: Did you come to me because you are not?

Frude: Not what?

ELIZA: Why do you ask?

Frude: Now I'm really confused.

ELIZA: How long have you been really confused?

Frude: Only since I met you.

The desire to assign personality and character to animals and inanimate objects long predates the arrival of the computer, and is indeed a universal human trait that may have evolutionary significance. *The Intimate Machine*, while paying decent attention to the history and theory of computers—including a brief lesson in programming in BASIC—devotes more space to the fascinating natural history of people's relationships with their pets and dolls, and with our attitudes toward puppets, ventriloquists' dummies, and automata of all kinds. Frude writes, "Throughout history, artifacts have been made to imitate people, and there has always been an audience eager to enjoy the ambiguity and to relish their own confusion."

This goes a long way toward explaining "why the few computer scientists who have attempted to write 'humanized' programs have often been shocked by the impact on users . . . the profound limitations of the programs on technical grounds have perhaps blinded them to the fact that people are used to elaborating slight cues."

Frude shows that relatively minor adjustments—"softer hardware, softer software"—may make computerized robots into true companion machines within a short time. At times he seems to be selling the idea of the computer as "counselor, colleague, and friend." But while Frude

provides striking examples of the great good to be provided by intimate machines, he stresses social challenges over engineering ones.

In the long run, we are helping the machines more than they will ever help us. Frude argues that the computer "may even be the human species' rightful heir." If so, we ourselves will have intimately aided its apotheosis.

—Paul Preuss

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## You Can't Judge A Book...

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### REAL MANAGERS USE PERSONAL COMPUTERS!

DICK HEISER  
QUE CORP.  
INDIANAPOLIS, IN.  
209 pp., \$14.95

**W**hy is it that writers of good computer books—books packed with serious, useful information on specific computer-related topics—feel that their works need cute titles? And, conversely, why do light, entertaining books that are not so heavy on substance have straightforward titles like *The Word Processing Book*? It's a mystery to me.

*Real Managers Use Personal Computers!* falls squarely in the first category. Regardless of the title, Dick Heiser has put together a realistic look at the advantages and disadvantages of using personal computers in business management. As an added bonus, he has done this in a simple, informative style that can be easily read by anyone used to reading *Forbes*, *Barron's*, or the business section of a daily newspaper. As summed up by the author, "The best and the worst experiences with personal computers depend more on what you try to do and how you try to do it than on what brand of machine you buy. This book is a digest of practical strategies you can use to make

your experience a satisfying one."

In the introduction, Heiser emphasizes the need to separate a manager's work from work that can be delegated. Management uses include calculating ("manager's problems involve adjusting values until something works out"); gathering, organizing, and communicating data; decision support; prototyping; and planning. In the latter activity, for example, "There's a high ratio of thinking to typing, the amount of data is relatively small, and there are opportunities to make non-routine judgments while you use the computer." On the other hand, transaction processing (the toxic kind of application you want to avoid) and production are clerical tasks to be quickly delegated, and though they are not discussed here, they probably would also benefit from computerization.

Each of the six most popular software applications used in these managerial functions—electronic spreadsheets, electronic graphics, electronic filing programs, critical-path scheduling programs, word processing, and electronic communications—is given its own chapter.

The most important of these, and the one covered in the greatest detail, is the electronic spreadsheet. With it, the computer has simplified two of the most tedious aspects of planning: juggling figures and playing what-if. This chapter could almost be used as an introductory tutorial for learning to use any spreadsheet program. Heiser shows exemplary spreadsheets filled in as they would be for various business applications, and goes on to compare the features of the most popular spreadsheet packages.

As far as what a manager needs to know about the computer hardware, there are four chapters in the book devoted to just that. And although the author has an admitted slant in favor of the IBM Personal Computer ("The IBM PC does have a few faults, but they're not very signifi-



cant"), his computer comparisons are reliable and fairly objective. He even offers strategies for dealing with computer dealers and salesmen when the time finally comes to buy.

Not content with his analyses of software and hardware for the business manager, Heiser adds a chapter on those gray areas many writers are too timid to approach: what to do with all those floppy disks that computers generate, how to organize disk files, how to set up a comfortable work area, and—very important in many corporate situations—how to deal with the EDP department ("Avoid suspicious activities. Don't transcribe thousands of facts from the corporate mainframe computer into your personal computer.").

Cover up this book's title and you have a highly respectable work that can help any business manager make the kinds of decisions that will make his future decisions a lot easier.

—Orlan Cannon

## Computers On Your Coffee Table

### THE PERSONAL COMPUTER HANDBOOK:

AN ILLUSTRATED GUIDE  
TO CHOOSING AND USING  
YOUR MICRO

PETER RODWELL

BARRON'S EDUCATIONAL SERIES, INC.  
WOODBURY, NY  
208 pp., \$14.95

**H**iding behind an unexciting cover (an Apple keyboard) and a nondescript title, *The Personal Computer Handbook* is a real stunner. Not content to publish the usual introduction-to-personal-computers-with-buyer's-guide, author Peter Rodwell, editor of the British magazine *Personal Computer World*, has come up with a compendium of information that could have just as easily been called *Everything You Always*

*Wanted to Know About Personal Computers But Were Afraid to Ask.*

Rodwell not only covers the entire history of computer design from Pascal's calculating machine to the Lisa, explains in simple terms the workings of every imaginable piece of computer hardware, and demonstrates programming techniques with lots of examples from several computer languages, but he does it all with over 450 beautiful photographs and diagrams, most of them in color.

I love any book that you can dip into at random, gaining almost as much information from the great illustrations and captions as from the text itself. This is that kind of book. It's organized into 47 "modules," each covering a different aspect of personal computers. Most modules are only two or three pages long—perfect for quick reading or ready reference. The longest modules are "Programming in BASIC" (with several pages of program listings) and the extensive buyer's guide (with lots of photos and specification charts).

The introductory chapters describe the history and development of computers and computer theory. We are given a fascinating guided tour of calculating devices from the abacus (3000 B.C., Babylonia) through Pascal's wooden calculating machine and Charles Babbage's Analytical Engine, up to ENIAC and UNIVAC and computers as we know them. As we move along, Rodwell explains in words, pictures, and diagrams what each machine was designed to do and how it was designed to do it.

There is a section on how to set up your own personal computer, with good, practical (although a bit obvious) advice on physical organization: "Put cables where they will not get in the way," and common troubleshooting: "It is surprising how many people try to obtain a color image from a black-and-white television set." He describes many of the problems people have when they first get



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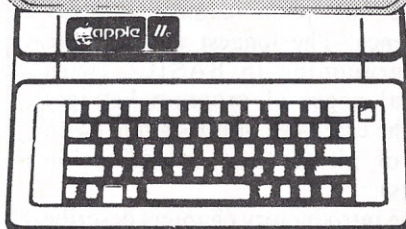
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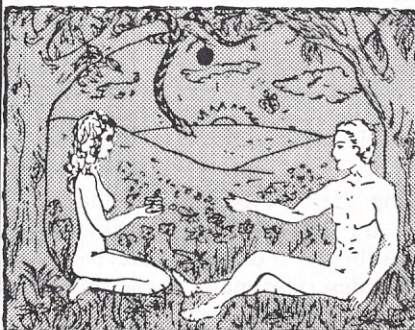
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started, and gives a quick introduction to writing in BASIC and saving programs on cassette.

The computer hardware sections follow, beginning with a lucid, plain-English explanation of how computers work. Rodwell then gets more specific, introducing the full range of microprocessor and memory chips, keyboards, printers, video screens, cassettes, disk drives, and assorted "exotica"—how they work, what they are used for, and how they are interfaced to the rest of the computer.

The most popular uses of personal computers—games, word processing, data-base management, graphics—are covered in the software section with descriptions of how they work and the different applications they are used for. There's even an introduction to flowcharting, a short tutorial on programming in BASIC, and a description (with sample programs) of Assembly language, C, Forth, Pascal, and LOGO.

The last module is the seemingly obligatory buyer's guide that publishers apparently demand in every new general computer book. This consists of descriptions, photos, and comparisons of 32 of the more popular brands of personal computers currently available. This will not serve anyone as a true buyer's guide—the computer marketplace today has too many variables to be summed up in one chapter—but it does give a good, realistic description of hardware options and expandability, software availability, and the strong and weak points of each model.

Peter Rodwell is British, and the British slant occasionally comes through. There is much information on the Timex/Sinclair TS 2000 computer (known in the U.K. as the Sinclair ZX Spectrum) which is very popular in Britain, but not readily available in the U.S. On the other hand, the language (at least in this edition, which is definitely aimed at Americans) is strictly American, and totally jargon-free. Even computer

jargon is avoided. Of course, it's impossible to write a book about computers without using some of the specialized vocabulary of the computer world, but this problem is solved by an extensive glossary and a series of "Memory Prompts" scattered throughout the book.

—Orlan Cannon

## Keep Your Computer Secure

### PROTECTING YOUR MICROCOMPUTER SYSTEM

HAROLD JOSEPH HIGHLAND  
WILEY PRESS  
NEW YORK, NY  
144 pp., \$14.95

**R**eading this book is like hearing an insurance salesperson's spine-chilling pitch and realizing just how vulnerable your life and property really are. The same applies to personal computers, says author Highland. Just as I hate to talk to insurance salespeople, I almost wish I'd never read this book, useful though its advice undoubtedly is. Now I'm worried about my computer, too.

The author kicks off with a series of accounts of unmitigated disasters, such as the disgruntled ex-employee who neatly sliced all the company's floppy disks with a paper cutter and the doctor whose X-ray equipment inadvertently zapped all his patient records. Of course, we are all aware of the recent publicity given to "hackers" who have used personal computers to access corporate and government computers. However, it still comes as something of a shock to realize that personal computers are open to abuses that go well beyond the mere theft of equipment.

The book sets out to tell us hapless users what can be done to make our machines more secure by limiting physical access and data access. Four major areas are covered: the physical

and environmental security of hardware, software protection, contingency planning and network security. The book is heavy on technical detail and practical advice. Be warned, however: This is not a book for novices.

The author is a well-known expert on computer security. He is editor-in-chief of the journal *Computers and Security*, and a national lecturer for the Association for Computing Machinery on the subject of personal computer security. His experience clearly shows.

If I have one major criticism of the book, it is one that applies not to the content but to the method of presentation of the section on software security. The programs and procedures described are for the CP/M operating system using CBASIC. While CP/M has been a widely used operating system, it is being supplanted by MS-DOS and its sibling, PC-DOS for the IBM Personal Computer. Highland's book would have been more useful if he had covered both MS-DOS and CP/M, and written his programs in the more frequently used Microsoft BASIC.

Indeed, the cover of the book shows a Columbia Data Products computer that runs MS-DOS and is generally compatible with a wide range of IBM Personal Computer programs. CP/M may have features that are suited to software protection schemes, but the author should not have ignored 16-bit operating systems, given the current state of technology.

However, for the expert user, this remains a useful book on a very significant topic. One can only hope that the publishers will be persuaded to bring out a revised edition that will look at both 16- and 32-bit operating systems, particularly in their multi-user versions.

In the meantime, if you're interested in knowing who might be doing what to your computer, pick up a copy of this valuable book.

—Jeffrey Bairstow





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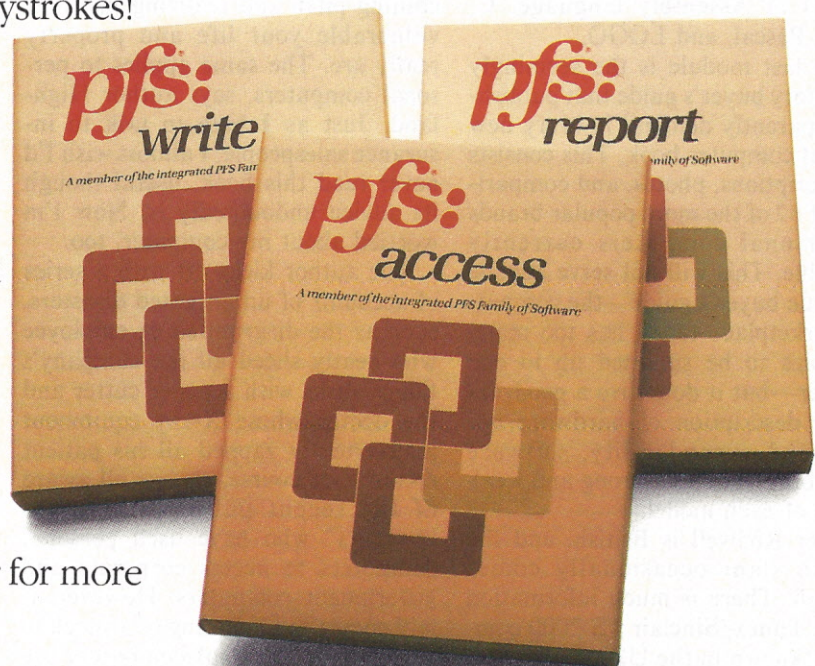
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## SYSTEMS

### SORD IS-11

**S**ord Computer of America has introduced its IS-11, a portable system with multiple-windowing capability, integrated software and a built-in microcassette recorder used for mass storage. Sord says its IS-11, nicknamed the "Consultant," is "the first computer of this size to offer multi-windowing capability."

"Features such as multi-windowing and integrated software give the 'Consultant' data-handling capabilities shared by no other briefcase-size computer," says Harvey Sperber, marketing manager for Sord. "From the user's standpoint," continues Sperber, "the 'Consultant' offers its own operating environment in which hardware, systems software and applications software appear to come together."

Windowing works within a single file running a single program, and you can create as many as 8 windows on the 40-column by 8-line display. So if you want data displayed from a part of the file not included in the 8 lines that are showing, you can create a window for that data and display it alongside what is showing. While you can create windows in and scroll through a single file, you cannot call up data from another file into a window.

Inside the IS-11 is 32k of non-volatile RAM memory (which means the data is retained even when the machine is off), expandable to 64k. Besides the integrated software built into the system's memory, a ROM pack containing an application program with up to 64k of memory can be plugged in.

Sord is so emphatic about the software built into the IS-11 that the "IS" in IS-11 stands for integrated software. Six function keys on the IS-11 simplify its use. Function keys correspond to the major functions available to the user in each software package and are defined according to the software being used.

For data handling, I-PIPS software lets you develop spreadsheets, or

create a data base, as well as do graphics, windowing and printing. As an example of the graphics capabilities, you can select any column or row of a spreadsheet, and with a keystroke, a pie or bar chart of the data will appear on the screen. With a printer hooked up, I-PIPS lets the IS-11 print out anything it will display.

The I-Calc software gives you the use of the four basic math functions: add, subtract, multiply and divide, as well as two functions which you can pre-program.

The I-Edit package has basic editing capabilities needed for producing and storing memos, speeches and letters, or for adding text to tables created.

For more complete word processing, the I-WP ROM-pack included with the IS-11 lets you create longer documents, and it has features such as cut and paste, and word search. The I-WP pack also lets you choose how many columns the document is to be printed in, though the display shows 40 columns.

Through the IS-11's RS-232-C interface, the I-Comm communications software permits users to transmit data using a single command.

In addition to the resident integrated software, Sord is developing generic applications software in 64k ROM-pack form. Included will be packs for sales, financial analysis and data transfer. The data transfer ROM-pack will automatically set protocols for transfer of data to a specific program's disk format (such as Lotus 1-2-3 on the IBM), or for connection to The Source or CompuServe.

In the hardware department, the IS-11 portable has a few special features. A key feature of the LCD display is its angle adjustment capability, which lets you read the display from several angles.

The IS-11's built-in microcassette recorder serves as the mass storage device, and it runs under the Tape Operating System, which allows it to operate with speed similar to that of a floppy drive because it builds a directory and will go right to the

memory location you name. Each tape you supply will hold 128k of data.

Weighing just 4 pounds, 6 ounces, the IS-11 operates on internal, rechargeable, nickel cadmium batteries, and the system will operate up to 8 hours on one charge. An AC adapter/charger is included with the unit.

Options which will soon be available include a \$169 thermal printer, a numeric keypad with 16 extra function keys, a 3½" floppy drive, a bar code reader and a BASIC programming module.

Suggested retail price for the IS-11 is \$995. Sord says an IS-11B version, with built-in modem, will be available in September for a suggested retail of \$1095.

**FOR MORE INFORMATION:** SORD COMPUTER OF AMERICA, INC., 645 Fifth Ave., New York, NY 10022; (212) 759-0140.

### Eve II

Touted as the total solution for home, business and educational needs, Eve II has 64k of RAM and will run CP/M and Apple DOS software. Eve II can produce 16 colors in high-resolution mode and it comes with a monitor, printer, disk drive and four programs.

**\$2195**

*Computer Technology International, Inc.  
200 Murray Hill Pkwy.  
East Rutherford, NJ 07073  
(201) 935-9300  
retail*

### Poly 8/16

Including an 80186 processor and Digital's Concurrent CP/M-86 (version 3.1), the Poly 8/16 is the first in a new family of S-100 multi-user, multi-processor systems.

The single-user, dual processor Poly 8/16 has a Z80 processor with 64k of RAM and an 80186 with 256k. With the two processors, the Poly 8/16 can run CP/M-80 and PC-DOS software.

**From \$4495**

*Polymorphic Systems  
460 Ward Dr.  
Santa Barbara, CA 93111*



## PRODUCTS

(805) 967-0468  
retail

### Vector SX

Available in three basic models, the Vector SX computers have 8086 and Z80B dual processors and standard RAM of 128k expandable to 896k. They have detached keyboards and integrated CRTs. The CP/M-86 operating system is standard and MS-DOS 2.1 is optional.

According to Vector Graphic, "The Vector SX was designed to be fast and highly reliable. The 8086 processor gives it a clock speed of 8 MHz."

The three models differ in mass storage devices: The model 2000 has two floppy drives; the Model 3000 has one floppy drive and a 10Mbyte Winchester; and the Model 5000 has one floppy and a 36Mbyte Winchester.

**\$4295** (Model 2000)

**\$6295** (Model 3000)

**\$9995** (Model 5000)

*Vector Graphic, Inc.*

*500 N. Ventu Park Rd.*

*Thousand Oaks, CA 91320*

*(805) 499-5831*

retail

## PERIPHERALS

### IBM PCJR COLOR DISPLAY

IBM has released a 13" color monitor specifically designed for use with its PCjr model. Retailing for \$429, the IBM PCjr Color Display is a direct-drive RGB display with 80-column and 40-column modes, and it can be used for graphics. IBM says the 80-column mode for text display offers better character definition and clarity than composite color monitors.

Dot addressability on the PCjr display is 320 by 200 pixels, which doesn't measure up to the 640 by 200 resolution of the IBM Personal Computer color monitor, but the PCjr display actually has a slightly wider bandwidth than the IBM Personal Computer color monitor.

Ergonomic factors were taken into consideration in the design of this monitor, and IBM used an etching

process to reduce glare on the screen's face. The PCjr Color Display can also be tilted up to 10 degrees.

IBM says the monitor will fit on top of the IBM PCjr system unit. For really personal use—like when the rest of the family is sleeping—the PCjr display has an earphone connector. Brightness, contrast and volume controls are up front so you don't have to reach around to the side or back of the unit.

IBM says its PCjr Color Display has a connector which can only fit the IBM PCjr, and that IBM only supports its use with the PCjr.

Offered with a 12-month limited warranty, the IBM PCjr Color Display is available through IBM Product Centers, IBM sales offices and authorized IBM personal computer dealers.

**FOR MORE INFORMATION:** IBM CORP., INFORMATION SYSTEMS GROUP, 900 King St., Rye Brook, NY 10573; (914) 934-4488.

### Add-Net

An interface card and software package, Add-Net allows personal computers to operate as intelligent workstations on an Alspa-Net local area network.

The card fits into a socket on the host computer and provides an RS-422 network interface. Software is provided on disk.

For Kaypro II, IV, 10; Eagle 2 series

**\$595**

*Alspa Computer, Inc.*

*477 Division St.*

*Campbell, CA 95008*

*(408) 370-3000*

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### Chairman Graphics Board

Using a single expansion slot, the Chairman replaces the IBM monochrome display/parallel printer adapter and color/graphics adapter cards. For a monochrome monitor, the Chairman will let you display graphics in 16 shades of green. Or it will drive your IBM color monitor in up to 16 colors.

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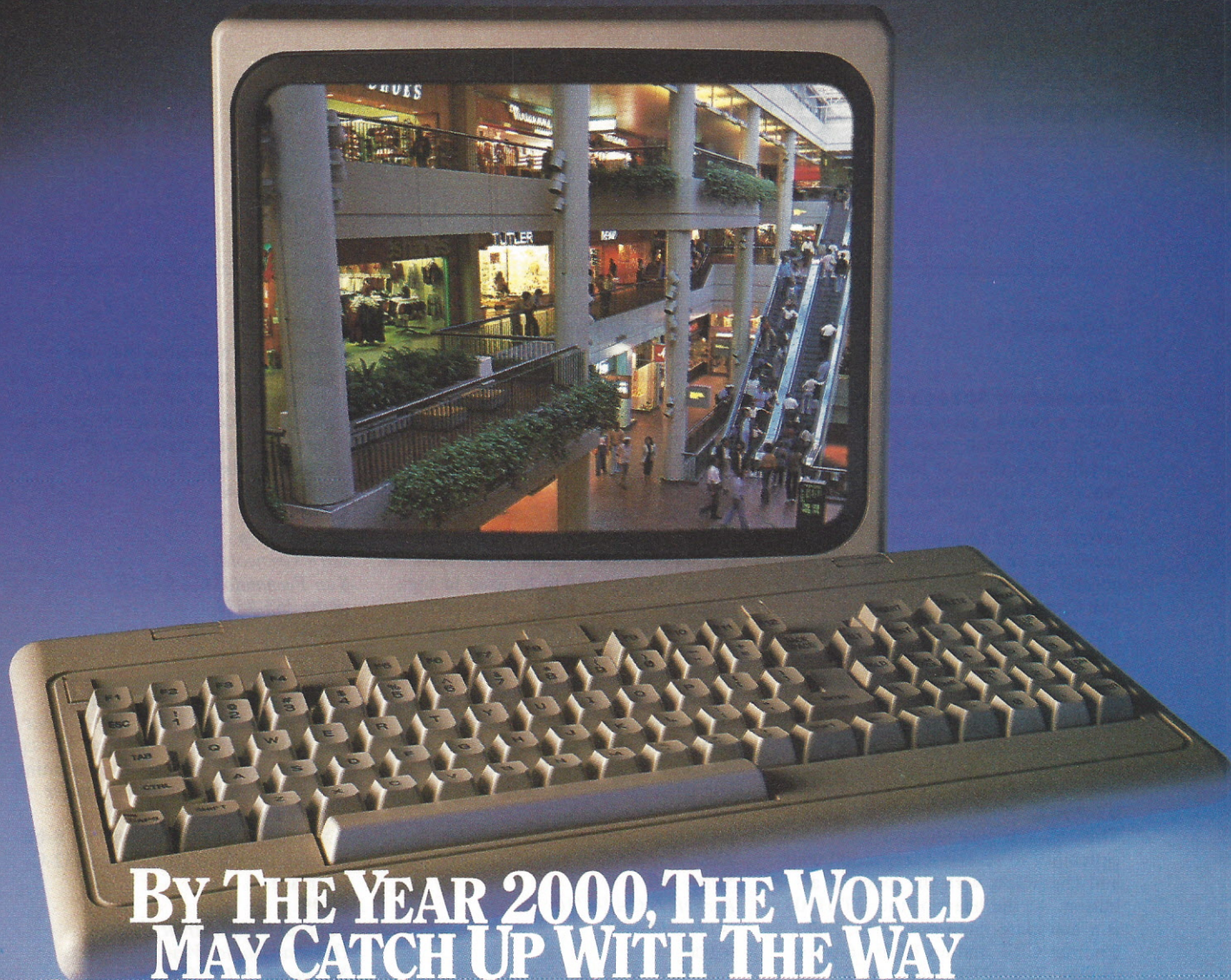
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### Commodore Speech Module

With a built-in vocabulary of 235 words, the speech module plugs directly into the user port and contains an additional port into which other "talking" and "non-talking" cartridges can be inserted. Voice speed can be user-defined to slow, normal or fast.

For Commodore 64

**\$59.95**

Commodore Business Machines, Inc.  
Computer Systems Division  
1200 Wilson Dr.  
West Chester, PA 19380  
(215) 431-9100  
retail

### DT-H103

This video display features the capability to reverse background color and characters with the touch of a button. At the heart of the DT-H103 is a non-glare, high-resolution, high-contrast CRT and an RGB 16-color display. The 80-character by 25-line screen measures 10" diagonally and offers a resolution of 640 by 480 pixels. It is compatible with systems that have a 20-pin square connector.

**\$753**

Panasonic Industrial Co.  
One Panasonic Way  
Secaucus, NJ 07094  
(201) 348-7183  
retail

### Electronic Compact 2

Capable of dual purpose use as a typewriter and personal computer printer, the Compact 2 is designed to address the need for a durable, low-cost daisy-wheel printer for personal computer applications.

The typewriter's operation is completely electronic and microprocessor-controlled and the Compact 2 is equipped with a built-in Centronics parallel interface for receive-only communications.

An optional interface extension module provides a parallel interface, and an RS-232-C serial interface with a 2k buffer memory. The typewriter has a print speed of 14 cps.

**\$599**

**\$149** (for interface extension module)

Olympia USA Inc.  
P.O. Box 22  
Somerville, NJ 08876-0022  
(201) 722-7000  
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### Hercules Graphics Card

Allows all the features of the latest version of the Microsoft Word word processing package to be used in high resolution on the IBM monochrome screen. One feature is a "see what you get" capability that lets users see details such as italics, boldface, subscripts and superscripts on the monitor exactly as they will be printed. Another feature gives users a choice of two character sizes. For IBM Personal Computer

**\$499**

Hercules Computer Technology  
2550 Ninth St.  
Suite 210  
Berkeley, CA 94710  
(415) 540-6000  
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### HP 7550A

Available with automatic cut-sheet paper feed, the HP 7550A plotter has a plot speed of 31.5 inches per second. This plotter also features front-panel function keys and an LCD display for reporting plotter status and program messages. A Replot feature draws up to 99 copies of an original graph without rerunning the program.

Pen types include fiber tip, roller ball and liquid ink. They are loaded in eight-pen carousels, which provide automatic plotter settings by pen type for pen speed and pressure.

The HP 7550A features both the HP-IB (IEEE-488) and RS-232-C/CCITT V.24 interfaces. Using just one serial computer port, the plotter can be connected either directly to the computer or in series between a terminal and the computer.

**\$3900**

Hewlett-Packard Co.  
1820 Embarcadero Rd.  
Palo Alto, CA 94303  
Call your local Hewlett-Packard sales office  
retail

### GP100-TI

Complete with a cable that lets it plug directly into the TI 99/4A computer, the GP100-TI printer features full dot-addressable graphics. It has adjustable tractors and uses a cartridge ribbon.

For TI 99/4A

**\$299**

Axiom Corp.  
1014 Griswold Ave.  
San Fernando, CA 91340  
(818) 365-9521  
retail

### KX-P1093

A bi-directional unit with logic-seeking head, the KX-P1093 printer can print 160 cps in pica and 135 cps in elite type. It features four printing modes: graphics, draft, near-letter quality and proportional. The KX-P1093 comes with both an 8-bit parallel interface and an RS-232-C interface.

**\$899**

Panasonic Industrial Co.  
One Panasonic Way  
Secaucus, NJ 07094  
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For DEC Professional 300, DECmate II, Rainbow 100

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For Commodore PET, CBM

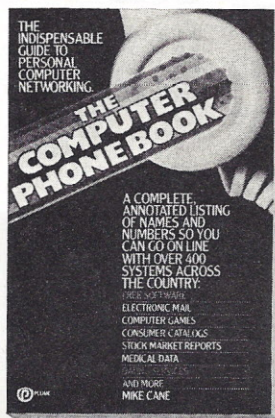
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#### TRS-80 DMP-110

A triple-mode dot-matrix printer, the DMP-110 features correspondence-quality word processing mode, data  
(continued on page 216)



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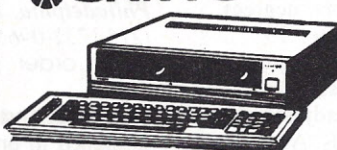
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*17**	*17**	N/A	*17**
*29**	*29**	N/A	N/A
*29**	*29**	N/A	*29**
*39**	*39**	N/A	*39**
*29**	*29**	N/A	*29**

*32**	*32**	N/A	*32**
*32**	*32**	*32**	*32**
N/A	*29**	*29**	*29**
*32**	*32**	*32**	*32**
*32**	*32**	*32**	*32**
N/A	*29**	*29**	*29**

*37**	N/A	*29**	*29**
*37**	N/A	*29**	*29**
*29**	N/A	*29**	*29**
*37**	N/A	*29**	*29**
*37**	N/A	*29**	*29**

*24**	*24**	*29**	*29**
*24**	*24**	N/A	N/A
*29**	*29**	N/A	N/A
*21**	*21**	*24**	*21**
*29**	*29**	N/A	*29**
*29**	*29**	*39**	*39**
*29**	*29**	N/A	N/A
*21**	*21**	*21**	*21**
*24**	*24**	*24**	*24**
N/A	*21**	*24**	*24**

*79**	*79**	*175**	*155**
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*159**	*159**	*159**	*159**
N/A	N/A	B/A	*269**
N/A	N/A	*199**	*199**
N/A	N/A	*199**	*169**
N/A	N/A	*199**	*199**
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CIRCLE 96





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(continued from page 213)  
processing mode and bit-image graphics mode.

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Contact your local Radio Shack store or Computer Center

### **Volksmodem**

Designed to be universally compatible, Volksmodem features a 300-baud operation, plug-compatibility with any wall phone jack, a full-/half-duplex switch, voice/data switch for phone use without disconnecting the modem and CMOS low-power circuitry. There are five adapter cables available for use with it—an RS232 DCE male, an RS232 DTE male, an RS232 DCE female, a TRS-80 Color Computer interface and an Atari interface.

**\$79.95**

*Anchor Automation, Inc.*

*6913 Valjean Ave.*

*Van Nuys, CA 91406*

*(818) 997-6493*

retail

## BITS & PIECES

### **ERGOTRON PEDESTAL BASE**

A "base for attitude adjustment" that's how Ergotron describes its Pedestal Base, designed for use with computer monitors, or system units. You mount the monitor or computer onto the Pedestal Base, which can handle units ranging in weight from 15 to 70 pounds. Then you have freedom to tilt or rotate the monitor or computer. Ergotron says that the freedom to change the position of the computer display helps change negative attitudes about working in front of it all day long.

Computers which can be mounted

on the Ergotron Pedestal Base include the Compaq, the Osborne 1, and the TRS-80 Model II. The Ergotron will handle monitors from IBM, Texas Instruments, Xerox, Westinghouse, and other manufacturers.

When the computer or monitor is mounted on the Pedestal Base, you can rotate it a complete 360 degrees. You can also tilt the monitor 15 degrees up or down from its standard position on the base. Thus, glare can be reduced, and you can adjust things to suit your mood or needs. According to the company, it doesn't take much strength to move the computer or monitor on the base.

The Ergotron Pedestal Base retails for \$149.95.

**FOR MORE INFORMATION:** ERGOTRON, INC., 5637 Woodlawn Blvd., Minneapolis, MN 55417; (612) 722-9299.

### **CT-170**

Including a dual-level top with adjustable keyboard and CPU shelves, the CT-170 oak wood desk measures 29" high by 50" wide by 28" deep.

The entire left-hand surface of the CT-170 can be adjusted to a typing height of 27", 28" or 29". Detachable keyboards can be tilted at 5, 10 or 15 degrees. The fixed half can hold a cassette or disk drive and even a printer.

**\$279.95**

*Bush Industries, Inc.*

*312 Fair Oak St.*

*Little Valley, NY 14755*

*(800) 228-2874*

retail

### **Keyboard Stepdown**

Compatible with most personal computers, the Keyboard Stepdown converts any standard-height desk or table into a computer workstation. It does this by hooking the keyboard to the edge of the desk.

**\$139**

*Omnium Corp.*

*201 N. Second St.*

*P.O. Box 186*

*Stillwater, MN 55082*

*(612) 430-2060*

retail

### **LG20 Surge Suptressor Multi-Outlet Strip**

This outlet strip offers protection

against voltage surges. It features four "U ground" outlets, an on/off switch with pilot light, a 6' cord with three-prong grounding plug and a push-to-reset circuit breaker.

**\$34.95** plus \$2 shipping

*Gadgeteer Co.*

*1524 Pine St.*

*Philadelphia, PA 19102*

*(215) 732-0965*

direct order

### **Sabon Stand**

Designed to provide better viewing of portable computer screens, the Sabon Stand holds equipment up to 20" wide and weighing 50 pounds.

**\$99.95**

*Sabon Industries*

*P.O. Box 177*

*Fairfield, CT 06430*

*(203) 255-8880*

retail

### **Smart Desk**

Ergonomically designed to minimize user strain and fatigue, Smart Desk will house most popular personal computers along with disk drives, modems, interface units and other peripherals. Constructed of simulated oak or walnut wood-grain, Smart Desk measures 34" wide by 36" high by 24" deep.

**\$149** plus shipping

*The Furniture Byte, Inc.*

*P.O. Box 1757*

*Longview, WA 98632*

*(800) 426-5301*

*(206) 423-7277 in Washington state*

direct order

### **Twist and Tilt**

Primarily designed for the IBM Personal Computer monochrome and color monitors, the Twist and Tilt monitor holder also has an adaptable plate to fit other monitors.

For IBM Personal Computer

**\$29.95**

*Contact Inland Corp.*

*32051 Howard*

*Madison Heights, MI 48071*

*(313) 585-2330*

retail

### **Uni-1**

Only 2" high, the Uni-1 tilt and swivel monitor base will accept any



monitor that fits on a 13" square.  
**\$49.95**  
**Curtis Manufacturing Co.**  
 305 Union St.  
 Peterborough, NH 03458  
 (603) 924-9992  
 retail

### Veri/Protektor Veri/Protektor II

Both models feature solid-state voltage suppressors to choke off damaging spikes caused by lightning, starting and stopping of motors and heavy inductive components on the power line. The Veri/Protektor II incorporates an additional line filter to filter out any unwanted electromagnetic interference. Four duplex outlets are provided on each model.

**\$69.95** (Veri/Protektor)  
**\$44.95** (Veri/Protektor II)  
*Verite'*

1614 W. Anaheim Rd.  
 Harbor City, CA 90710  
 (213) 325-0200  
 retail

## BUSINESS

### DOW JONES ACCOUNTING SERIES

**D**ow Jones Information Services, a division of Dow Jones & Co., has introduced three packages in its seven-part Dow Jones Software Accounting Series for the IBM Personal Computer and XT. Designed by accounting professionals for small businesses, the first three programs include General Ledger, Accounts Payable, and Accounts Receivable.

As part of the Dow Jones Accounting Series, you receive a customer training seminar developed by Arthur Young, one of the country's leading public accounting firms. The seminar, combining hands-on training with lecture presentation, is conducted by Arthur Young-certified instruction. A toll-free support phone number is also available until a year after the purchase.

"We believe the (series) will set a new standard in the software

industry," says Carl Valenti, vice president of Dow Jones Information Services. "With the series, and its strong customer-assistance program, the user is assured of an easy, accurate transition to the computerized system."

The central program in the series, General Ledger, has a flexible chart of accounts permitting you to specify, without any practical restriction, the type of chart desired. Both Accounts Payable and Accounts Receivable have a select-and-sort capability for accurate account monitoring and analysis.

All programs in the series are integrated, allowing information developed in Accounts Payable, for example, to be automatically recorded in the appropriate General Ledger journals. The first three packages in the series retail for \$1000 each, with Inventory, Management Analysis, Sales Order Entry, and Purchase Order Entry planned for introduction in early 1985.

**FOR MORE INFORMATION:** DOW JONES INFORMATION SERVICES, P.O. Box 300, Princeton, NJ 08540; (609) 452-2000.

### Accounting Pearl

Accounting Pearl is an integrated system which includes general ledger, payroll, accounts receivable, accounts payable and inventory. The system will also allow you to create customized reports and forms for vertical applications.

For IBM Personal Computer with 128k, two disk drives and printer  
**\$895**

*Relational Systems  
 International Corp.  
 Pearlsoft Division  
 25195 S.W. Pkwy.  
 P.O. Box 638  
 Wilsonville, OR 97070  
 (503) 682-3636  
 retail*

### Aladin

Aladin is a data base management system which can be integrated with other programs, such as WordStar and VisiCalc. It incorporates calculation, statistics and graphics capabilities. The modules integrated within the program include Data,

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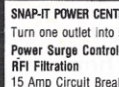
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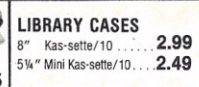
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CIRCLE 208



# Two ways to show off your IBM PC.™



There's no better way to show off your IBM PC – or any other micro – than with the new line of Toshiba printers. They offer state-of-the-art features, high reliability and low price.

## **P1351**

The new Toshiba P1351 printer has a unique high-density 24-pin dot-matrix print head. It lets you print crisp, clean letter copy at 100 cps, draft copy at 192 cps. And with the software-selectable downloading fonts, you get to pick from a variety of type styles.

The P1351 has more stuff to show. Like 180 x 180 dots-per-

inch high-resolution graphics, 132-column-width platen (great for spreadsheets and Lotus™ 1-2-3™ data processing and graphics), Qume SPRINT 5™ emulation, and a choice of either a forms tractor or automatic sheet feeder.

## **P1340**

For considerably less, the new P1340 gives you just a little less. But it still has the same high-density 24-pin dot-matrix print head, the 180 x 180 dots-per-inch graphics resolution, and the Qume SPRINT 5 emulation. In addition to true proportional spacing and a

built-in forms tractor. Whichever printer you choose, you also get nationwide service within 24 hours by Western Union technicians.

So the choice is yours. But when you choose Toshiba, you know you're putting on the best show possible.

For more information, call one of the distributors listed on the adjacent page.

IBM PC to P1340 and P1351 graphics utilizes PaperScreen and the IBM PC with color graphics adapter. IBM PC is a trademark of International Business Machines. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. SPRINT 5 is a trademark of Qume Corporation.  
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In Touch with Tomorrow

# **TOSHIBA**

Information Systems Division, TOSHIBA AMERICA, INC.

CIRCLE 39



## Where to buy Toshiba's P1351 and P1340 printers:

### EASTERN

R & D/CAMELOT ASSOCIATES, INC.  
Northampton, MA (413) 253-7378  
DIGITAL ENTRY SYSTEMS  
Waltham, MA (617) 899-6111  
MICROAMERICA  
Framingham, MA (800) 343-4411  
In MA (617) 877-8500  
CYBER/SOURCE  
Southfield, MI (313) 353-8660  
GENERAL BUSINESS COMPUTERS, INC.  
Cherry Hill, NJ (609) 424-6500  
MONROE DISTRIBUTING COMPANY  
Cleveland, OH (216) 781-4600  
ROBEC DISTRIBUTORS  
Line Lexington, PA (215) 822-0700

### SOUTHERN

SYSPRINT, INC.  
Sarasota, FL (813) 924-8278  
MICROAMERICA  
Tampa, FL (813) 623-6526  
In FL (800) 282-3385  
Norcross, GA (800) 241-8566  
In GA (404) 441-0515  
Rockville, MD (800) 638-6621  
In MD (800) 492-2949  
ZAMOISKI COMPANY  
Baltimore, MD (301) 644-2900

### CENTRAL

TEK-AIDS INDUSTRIES, INC.  
Arlington Heights, IL (312) 870-7400  
or (800) 323-4138  
KALTRONICS DISTRIBUTORS, INC.  
Northbrook, IL (312) 291-1220  
MICROAMERICA  
Schaumburg, IL (800) 323-6827  
In IL (800) 942-4690  
Richardson, TX (800) 527-3261  
In TX (800) 442-5847

ONE STOP MICROPRODUCTS  
South Bend, IN (219) 277-4972  
MIDTEC ASSOCIATES dba CRYSTAL COMPUTERS  
Lenexa, KS (913) 541-1711  
B & W DISTRIBUTORS  
St. Louis, MO (314) 569-2450  
SMC INTECH SYSTEMS CORP.  
Carrollton, TX (214) 446-9055  
COMPU SHOP  
Richardson, TX (214) 783-1252  
SYSPRINT, INC.  
Richardson, TX (214) 669-3666

### WESTERN

P.G.I. CORPORATION  
Tempe, AZ (602) 967-1421  
or (800) 528-1415  
MICROAMERICA  
Carson, CA (800) 421-1485  
In CA (800) 262-4212  
BYTE INDUSTRIES, INC.  
Hayward, CA (415) 783-8272  
or (800) 972-5948  
outside CA (800) 227-2070

PREMIER SOURCE DISTRIBUTING  
Irvine, CA (714) 261-2011  
CYPRESS DISTRIBUTING COMPANY, INC.  
San Jose, CA (408) 297-9800  
MICROWARE DISTRIBUTORS, INC.  
Aloha, OR (503) 642-7679  
Bellevue, WA (206) 451-8586  
ANACOMP, INC.  
Salt Lake City, UT (801) 539-0158  
Redmond, WA (206) 881-1113  
or (800) 426-6244

### CANADA

IRWIN ELECTRONICS  
Etobicoke, Ontario (416) 626-6600

### OR THESE TOSHIBA AMERICA, INC. REGIONAL OFFICES:

177 Madison Avenue, Post Office Box 2331R  
Morristown, NJ 07960 (201) 326-9777  
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# TOSHIBA

## PRODUCTS

### Report, Query, Calculation, Word Processing Bridge, Grouping and Statistics.

For Apple II series (64k and two disk drives) or III (hard disk and 256k); IBM Personal Computer, XT (192k and two disk drives or hard disk); Corvus Concept; Sage II and IV; DEC Rainbow series; Victor 9000; TI Professional; Altos 586  
**\$595** (Apple II series)  
**\$795** (all others)

*Advanced Data Institute, Inc.*

1215 Howe Ave.  
Sacramento, CA 95825  
(916) 925-2229

retail or direct order

### The Benchmark

New releases in The Benchmark series of office productivity software include: Administrator, a directory program that integrates all of the application programs; Financial Planner, a spreadsheet; Data Manager, a data base; and Graphics, a charts and graphs program that also allows you to draw freehand.

For MS-DOS or CP/M-based systems  
**\$295** each

**\$195** for Administrator

*Metasoft Corp.*

6509 W. Frye Rd.

Suite 12

Chandler, AZ 85224

(602) 961-0003

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### General Management Series

Designed to help manufacturing people involved with general management responsibilities, The General Management series includes: PartPlan, a product/items/parts system; EnergyPlan, a utilities data and forecasting program; TrendPlan, a forecasting system; ScrapPlan, for scrap reports and defect analysis; EquipPlan, for equipment inventory control and pricing; UpkeepPlan, a machinery and equipment data system; WorkPlan, a department performance measure; PlantPlan, a building and grounds system; PricePlan, a pricing, coding and analysis system; and CostPlan, a data history and forecasting program.

For MS-DOS systems

**\$150** each

*DacorMFG Software Systems*

13330 Bishop Rd.

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Bowling Green, OH 43402

(419) 354-3981

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### In-Search

In-Search lets you access more than 200 electronic public information libraries or on-line data bases offered by Dialog Information Services. Once connected to the data base, the program guides you through information searches with on-screen graphics, Help commands and built-in data base descriptions.

For TI Professional; IBM Personal Computer

**\$399**

*Menlo Corp.*

4633 Old Ironsides Dr.

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### Nutshell Information Manager

Nutshell Information Manager is a menu-driven program that features virtually unlimited data fields, word indexing, imbedded prefix matching, reformatting word wrap and customized reports with summaries. A learning disk is also included. The program is designed to be an information package bridging the gap between simple filing programs and complex data base management systems.

For IBM Personal Computer

**\$395**

*Leading Edge Products, Inc.*

225 Turnpike St.

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### Oper 8

Oper8 is designed to provide operations management personnel with purchasing, sales order and inventory management systems. The purchasing and sales order programs can be purchased separately. For CP/M systems with hard disk and 132-column printer

**\$2250**

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## PRODUCTS

17131 Hofer Ct.  
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direct order

### Printer Basher

Printer Basher is a printer utility program designed to provide menu-based operation of all control functions and print modes for all Epson printers.  
For IBM Personal Computer, XT; Apple IIe; Compaq; Epson QX-10  
**\$59.95**

*Speer Research Corp.*  
Connecticut Software Division  
30 Wilson Ave.  
Rowayton, CT 06853  
(203) 838-1844  
retail or direct order

### Protracs

Designed to track tasks over time by either responsibility or priority, Protracs is aimed at corporate analysts and project leaders. The program lets you track up to 100 separate projects containing up to 100 tasks each which can be sorted by any field for custom reports.

For IBM Personal Computer, XT, PCjr with 128k  
**\$59.95**

*Applied Microsystems, Inc.*  
P.O. Box 832  
Roswell, GA 30077  
(404) 475-0832  
retail or direct order

### Sign-Plot

Sign-Plot is a plotter program that allows you to produce six different letter font styles for creating word charts with upper- and lowercase, punctuation and numbers as part of the font program. Vertical and horizontal positioning of the text in fractional inch increments ensures exact size and location of the lettering.

For IBM Personal Computer with 128k and two drives; CP/M-80 systems  
**\$149**

*Centerpoint Computer Applications*  
500 N. Michigan Ave.  
Chicago, IL 60611  
(312) 467-0333  
retail or direct order

### Spectaculator

This cassette-based spreadsheet program automatically calculates and displays computed values and also answers what-if questions. Possible uses include forecasting, statistics and math homework.

For TRS-80 Models I, III, 4  
**\$49.95**

*Radio Shack/Tandy Corp.*  
1800 One Tandy Center  
Fort Worth, TX 76102  
(817) 390-3154  
retail

## EDUCATION

### THOROUGHbred EDUCATIONAL SOFTWARE SERIES

**G**eared for home use by students from the fourth grade through high school, the Thoroughbred Educational Software Series from Science Management Corporation (SMC) covers a range of disciplines, including biology, chemistry, physics, social studies, math, art and music.

Each topic in the Thoroughbred series, developed by the Classroom Consortia Media research firm, contains five individual lessons that take about one hour to complete. Packages in the series, designed to accent classroom learning, retail for \$50 each.

"The Thoroughbred series offers students the opportunity to extend the learning process to the home," says Raymond D. Novak, president of SMC Software Systems. "Each Thoroughbred package is designed to present and reinforce concepts that are integral parts of the student's school curriculum."

Programs in the Thoroughbred Educational Software Series run on the IBM Personal Computer, XT, and PCjr. Versions for the Apple II series will be available soon.

**FOR MORE INFORMATION:** SMC  
SOFTWARE SYSTEMS, 1011 Route 22,  
P.O. Box 6800,  
Bridgewater, NJ 08807;  
(201) 685-9000.

### Agent USA

Agent USA is an educational adventure game set in the train stations of 100 different U.S. cities and is designed to help children learn geography.

For Atari 800 with joystick  
**\$29.95**

*Scholastic, Inc.*  
730 Broadway  
New York, NY 10003  
(212) 505-3000  
retail

### Bannercatch

Bannercatch is designed to encourage children to work as a team to break the code and capture the flag of a team of computer-controlled robots.

For Atari 800 with two joysticks  
**\$29.95**

*Scholastic, Inc.*  
730 Broadway  
New York, NY 10003  
(212) 505-3000  
retail

### Chatterbee

An interactive spelling program with synthesized speech, Chatterbee is designed to teach spelling to students of all ages. The program has a 2500-word dictionary.

For all Atari models; Commodore 64  
**\$39.95**

*Tronix Publishing, Inc.*  
8295 S. La Cienega Blvd.  
Inglewood, CA 90301  
(213) 215-0529  
retail

### Diascriptive Reading I

Diascriptive Reading I is a diagnostic, prescriptive reading program for younger children. The program diagnoses the reading skills of a child, then prescribes what is required for improvement and evaluates performance at each level.

For Apple II Plus, IIe; Commodore 64; TRS-80 Models III, 4  
**\$295**

**\$245** (cassette)  
*Educational Activities, Inc.*  
P.O. Box 392  
Freeport, NY 11520  
(516) 223-4666  
direct order



### Early Childhood Learning Program

Based on the philosophy of the Logo language and the research of Jean Piaget, this program is designed to let students acquire cognitive skills in much the same way they acquire language skills. Among the skills available to the student are: letter and number recognition, making judgments, color recognition, and others. For Apple II series; Commodore 64

**\$149**

*Educational Activities, Inc.*  
P.O. Box 392  
Freeport, NY 11520  
(516) 223-4666  
direct order

### Lucky's Magic Hat

An aid for developing reading comprehension, sequential thinking and memory skills, Lucky's Magic Hat guides you through a fantasy land of leprechauns who have scrolls containing pictures, words and patterns for study.

For Apple II series

**\$39.95**

*Advanced Ideas, Inc.*  
2550 Ninth St.  
Suite 104  
Berkeley, CA 94710  
(415) 526-9100  
retail or direct order

### Matchmaker II

Designed for home use, the Matchmaker II series of programs includes: French Vocabulary Skills, World History Facts, U.S. History Facts, U.S. Government Facts, Biology Facts and Elementary Science Facts.

For Apple IIe; Atari 800; Commodore 64; IBM Personal Computer; TRS-80 Color Computer

**\$39.95 each**

*American Educational Computer*  
2450 Embarcadero Way  
Palo Alto, CA 94303  
(415) 494-2021  
retail or direct order

### Math Mileage

In Math Mileage, children develop estimation skills as they race against the clock. It also teaches addition,

subtraction, multiplication and division.

For Commodore 64; Atari 800

**\$29.95**

*CBS Software*  
One Fawcett Pl.  
Greenwich, CT 06836  
(203) 622-2525  
retail or direct order

### Micros For Micros

Micros For Micros is a series of four programs designed to provide an introduction to computers while teaching basic skills. The programs include Numbers, Estimating, Music and Words.

For Apple II series

**\$34.95 each**

*Math and Computer Education Project*

*Lawrence Hall of Science*  
University of California  
Berkeley, CA 94720  
(415) 642-3167  
direct order

### Monkey Series

MonkeyNews and MonkeyBuilder, both for grades 1 through 6, are the two new additions to the Monkey Series. MonkeyNews is designed to help develop reading and comprehension skills. MonkeyBuilder combines word fragments to form correct words.

For Apple II series; all Atari models; Commodore 64

**\$29.95 each**

*Artworx Software Co., Inc.*  
150 N. Main St.  
Fairport, NY 14450

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CIRCLE 213



# "Thoughtware, How Can I Become A More Effective Leader?"



*Thoughtware is new, easy-to-use software that will help you see and understand how to become a better manager. It's a unique series of personal, computer-based management diagnostic and training programs.*

® Thoughtware is a registered trademark of the Institute for Management Improvement.

How can you become a more effective leader? Thoughtware Program 2.1, "Leading Effectively," will tell you. This four part program has been designed to help managers improve their effectiveness as leaders. It gives you an opportunity to assess your own management style and to compare your results to the self-assessments of other managers.

**Unit 1** defines leadership and discusses its three key elements—style, situation and strategy. It stresses the importance of matching the leadership style to the situation and of getting and giving feedback.

**Unit 2** is designed to improve your leadership style

and increase your ability to perform more effectively. You will see the difference between the kinds of power you exert and the importance of using your influence to affect the behavior of others. You'll also learn about three factors affecting your leadership style: the assumptions you make about people, the degree to which you are task- or people-oriented, and the attitudes you have about the competence of those you supervise.

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The key element in both Enchanter and Sorcerer, says Infocom Product Manager Michael Dornbrook, is magic. "With its focus on magic, the Enchanter series has really given players a new type of challenge," he explains. "In Enchanter, and now Sorcerer, players advance toward their goal through the use of magical powers they acquire along the way."

Dornbrook adds that Sorcerer can understand a vocabulary of more than 1000 words—almost 50 percent more than other interactive fiction games.

"That capability allows Sorcerer to add substance to the Zork-Enchanter universe by supplying it with a richly detailed history and geography,"

Dornbrook says.

Sorcerer, written by the author of



---

## PRODUCTS

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Planetfall, includes Popular Enchanting Magazine (the manual), Creatures of Frobozz Infotater (a rotating data wheel), and a holding pouch. The program runs on many personal computers, including the Apple II series, all Atari models, Commodore 64, IBM Personal Computer and PCjr, TRS-80 Models I and III, TI 99/4A and CP/M-based systems.

Sorcerer retails for \$49.95 and up, depending upon the system.

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## Epson's Yasuhiro Tsubota Thinks American

**I**n 1980, when "personal computing" had become a household term, the only reliable printers were electromagnetic units that used ball, daisy-wheel or thimble mechanisms and cost as much or more than the computers they were designed to work with. Then Japan's Epson entered the market with the MX-80 dot-matrix printer. Compact, reliable and affordable, the MX-80 brought dot-matrix technology within reach of the average user.

Epson got into the printer business through the back door when its parent company, Seiko Watch, was named the official timekeeper of the 1964 Olympics and had to provide fast and reliable printouts at finish lines. Epson developed the EP-101, with a drum-printing mechanism still used today in hand calculators and cash registers. Later versions of the EP-101 were considered "sons" of the original and Epson became the brand name. The company moved into dot-matrix printing and soon became the industry leader by improving the technology and incorporating it into a wide range of products for the consumer market.

Today, Epson produces more dot-matrix printers than all other manufacturers combined. But printers are only part of the picture—Epson has been in the small computer business in Japan since 1978 and released its first entry to the American market, the "notebook" size HX-20, in late 1982. The desktop QX-10 with VALDOCS ("valuable documents") integrated software was introduced a few months later. While Epson's success in the printer market is unrivaled, the company's personal computers have been slow to build up a solid market share. (Current estimates put

the market share of the QX-10 and HX-20 at two percent, with between 50,000 and 100,000 units, respectively, of each model sold.) Epson's new products and market strategies are aimed at gaining a larger piece of the lucrative personal computing market in America.

The man behind this effort is Epson America president Yasuhiro Tsubota (pronounced Soo-boata). A

46-year-old Tokyo native who previously worked for Control Data and C. Itoh in Japan, Tsubota came to the United States in 1974 to open Epson America in Torrance, California. His English is filled with Americanisms, but the accent remains. The traditional Japanese politeness and reserve are obvious, and Tsubota is most cautious when discussing the computing industry.



Photograph by Raúl Vega



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*As someone who's been involved with personal computer technology and marketing since the early days, how do you see the market today?*

**Tsubota:** There's too much confusion. We are still learning that what we are selling is systems, not computers, monitors, printers or programs. The first Japanese and some of the American companies tried to sell computers like cars and stereos. They depended on dealers to provide the support and service networks necessary to educate consumers. To be successful you have to know that personal computers are a different ballgame. The hardware and software, distribution and support network, and promotion have to all be ready to go at the same time if you want to be taken seriously.

*There must be more to being successful than that?*

**Tsubota:** I don't like the term "user friendly," but I know that people will not spend a lot of time learning how to use a personal computer. The system has to produce results fast. A lot of progress has been made, but the industry still has a long way to go. Before too long, a personal computer will be a walk-in purchase. Buyers will develop enough trust in established brand names that a lot of investigation and comparison will no longer be necessary.

*Are dealers the key to reaching that level of consumer acceptance?*

**Tsubota:** They are the front lines for sure. When personal computers first began to become popular, there were no established ways of selling them. The hobbyist dealers were in the best shape, but there were only a few stores in comparison to what was needed to serve a growing demand. As a result, many, many people became retailers who didn't know as much as they should about financing, inventory, display and sales. The outcome was dealers failed and their failures hurt the industry.

*Should manufacturers have done more to support their dealers?*

**Tsubota:** Very definitely. In fact, the Japanese companies did the poorest job, but a lot of American manufacturers were guilty, too. The support has to be nearby and that means the distribution network must be more than a group of warehouses. The manufacturer needs to provide services that help dealers to be good businessmen and provide customer satisfaction.

*How does Epson handle its relationship with dealers?*

**Tsubota:** Here (in the U.S.) we took a different path. We decided that the consumer electronics business came

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***"We are still learning that what we are selling is systems, not computers, monitors, printers or programs."***

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the closest to what a distribution and dealer network should be. We hired executives from Zenith, RCA and GE dealerships to run our 12 regional distributorships. They didn't know computers, but they did understand the importance of dealers and how to support them.

*Do you see other personal computer manufacturers following the same course?*

**Tsubota:** I don't know. Strong support is essential, IBM proved that. How well Epson does is being watched. The move of major retailers into personal computer sales is a good sign. Buyers have to trust their dealer and everything that the personal computer companies can do to build buyer confidence will be good for our industry.

*What about the use of personal computers in business and education? Will expansion in these areas filter into the home?*

**Tsubota:** The more people who learn to use personal computers the better. Children are the most receptive. There's no doubt that they like computers and are teaching adults to do the same. The biggest challenge is to get older people to try personal computers. The industry is making advances, but we still have a long way to go. Better software and introductions to computers as part of the office will help a lot with people who are my age (46).

*One aspect of the current feeling about personal computers is that they are seen to be as "American as apple pie." Is there resentment of the Japanese as challengers to U.S. companies?*

**Tsubota:** Product quality, not where it's made, will be the real difference. Any Japanese or European company with a good system can compete. The Americans are ahead, but the race is still on. Also, the U.S. isn't the only market. Japan has taken to the personal computer and the American companies are further behind there than we are here. Europe is a big question mark. Ten years from now we'll have the answers about which country will dominate worldwide. In the meantime, the battle will be interesting.

*Earlier you said that there was confusion in the marketplace. Isn't Epson adding to the confusion by selling printers as add-on components to personal computers?*

**Tsubota:** Not really. We have compatibility with virtually all computers and a number of personal computer companies sell our printers under their own brand names. Right now there are 3500 to 4000 computer dealers in the U.S. and all of them sell Epson printers as part of many personal computer systems. In addition,





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tion, we pioneered the concept of bundling a printer with the personal computer purchase. If you buy an Epson QX-10, the price includes an Epson RX-80 FT printer as well as software. I think Epson has contributed to the concept of selling systems by making our dot-matrix printers a good match with as many personal computers as possible.

*How then, are you meeting your own criteria for selling fully supported and serviced systems?*

**Tsubota:** Epson makes computers that are designed to be sold in retail stores as ready-to-use units and right now we have about 800 dealers who have signed appointment agreements. That means they have agreed to meet certain standards in terms of customer support and service. Backing our dealers are 12 regional distributors with complete inventories, employees who provide sales, educational and merchandising training, and are run by independent executives with extensive experience in consumer electronics. We established this network before the first Epson personal computer was sold and backed it with quality products and one of the largest ad campaigns in personal computer history. Epson didn't make promises until it was sure it could deliver.

*If this strategy is valid, does it mean that Epson will soon be a major force in the personal computer market?*

**Tsubota:** IBM is far ahead of everyone else, as we all know. When it comes to the market we have targeted—the small business and professional home user—I'm fully aware that we are way behind IBM, but some industry sources sandwich us between the Apple II and Lisa.

Our first year goal, after we gained national distribution in July of last year, was to become a factor in the personal computer market and that requires at least 50,000 personal computers sold. We are handsomely beyond that number.

*To compete effectively, will you have to cut the prices of your computers, particularly the QX-10?*

**Tsubota:** At \$5 under \$3000, including our own integrated software and the RX-80 FT printer, the QX-10 is highly competitive as a system. Because we own our distribution organizations, we have legally avoided deep discounts on our personal computers. Epson's philosophy is to hold to its list price and enhance it by offering more value. I can't say now what we will be offering next in terms of bundling, but no radical changes are planned. There'll always be price pressures. Our dealers can set prices as they wish, but the required levels of service and support don't permit much price-cutting.

*“Ten years from now we'll have the answers about which country will dominate worldwide.”*

*What about the briefcase HX-20? Has it been lost in the effort put behind the more expensive QX-10?*

**Tsubota:** We had to set some priorities. The HX-20 was introduced in 1982 and was the first truly portable computer. The Tandy 100 didn't appear until six or eight months later. I admit that we chose the HX-20 for publicity value. We wanted to establish the Epson name beyond printers and a totally new type of computer was the way to get attention. At the same time, the QX-10 was getting ready for introduction and something had to give.

We haven't neglected the HX-20, but the real potential for computers in this class is further in the future. We are enhancing the HX-20 and new software is available. You don't need to know much about notebook computers to figure out that when it

comes to display screen size, RAM, an internal modem and magnetic storage, the HX-20 has to be improved. Epson sees a high growth potential for this type of computer and has no intention of dropping the ball.

*What about printers? By now, most personal computer users know that the new Epson 24-pin model is available.*

**Tsubota:** The LQ-1500 operates at almost 200 characters per second, closely approaches the quality of daisy-wheel printers in the correspondence mode and prints graphics that approximate half-tone photos. The list price of under \$1500 isn't beyond professional personal computer users, even though the primary market is business.

*Is the LQ-1500 a full replacement for a daisy-wheel, or letter-quality printer?*

**Tsubota:** Everybody tries to make a battle between dot-matrix and daisy-wheel. Letters and reports that have to look typewritten will continue to be done on electromagnetic printers. Our goal is to provide high print quality for text and graphics on the same piece of paper and that can only be done right now with a dot-matrix printer.

*Another area that Epson pioneered was user friendliness in integrated software and you had some problems. What's going on with VALDOCS now?*

**Tsubota:** We expect version 2.0 out in June and it will be one of the most thoroughly tested pieces of software ever offered. I know we stumbled with the early VALDOCS and the bad reviews and word of mouth hurt us. We have provided two free updates to all QX-10 users and most are satisfied.

*What other developments are there in the software area in terms of the so-called “Japanese software gap”?*




## INTERVIEW

**Tsubota:** The Epson personal computers include CP/M-80 and that eliminated any major problems with software availability, particularly for those buyers who wanted programs more sophisticated than VALDOCS. We now have more than 200 CP/M-80 programs adapted for the QX-10 and new software is out for the HX-20. An important selling point for the QX-10 is its special keyboard, with its labeled keys. The most popular CP/M programs such as WordStar, dBASE II, PeachText, Personal Pearl and SuperCalc have been customized to use our keyboard's function keys and totally compatible versions are on the way that can be used without keyboard overlays.

*CP/M is somewhat out of vogue. What about other operating systems, particularly MS-DOS?*

**Tsubota:** We have just introduced a plug-in board that runs MS-DOS programs and makes the QX-10 about 80 percent IBM-compatible. The board sells for \$795 and contains 256k of additional RAM. This also doubles available RAM when used with VALDOCS or CP/M programs. We also have introduced an intelligent modem as a plug-in board for \$159. It operates at 300 baud full duplex and provides automatic answering, one-key redial, audio monitoring and touchtone or pulse dialing. The Epson QX-10 has four expansion slots.

*It sounds like Epson is taking the traditional Japanese approach of imitating rather than leading. What is your feeling on this?*

**Tsubota:** If we are doing anything that's typically Japanese, whatever that is, it's news to me. Our distribution and dealer-support network is way ahead of almost all of our competitors. We build the highest quality hardware, using, for example, disk drives with voice coil motors found in hard disks instead of the cheaper lead-screw or solenoid motors. We made "user friendly" mean exactly what it says with VALDOCS. I don't like to brag, but there'll be more imitation of Epson than there will be imitating by Epson. 

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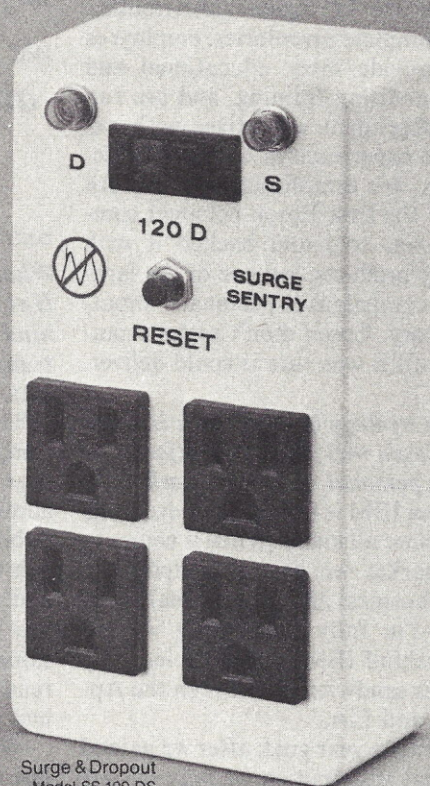
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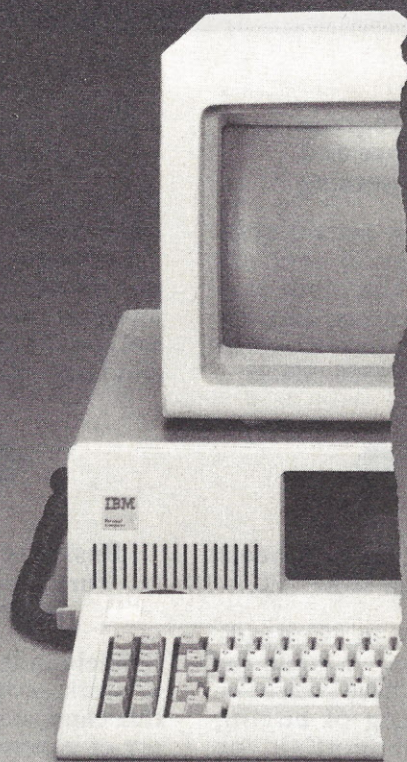
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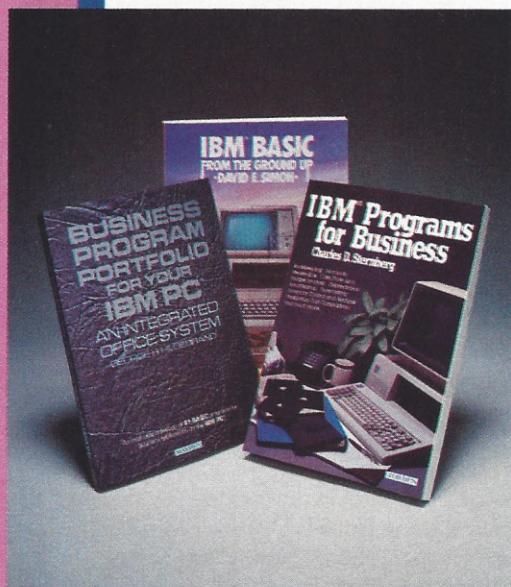


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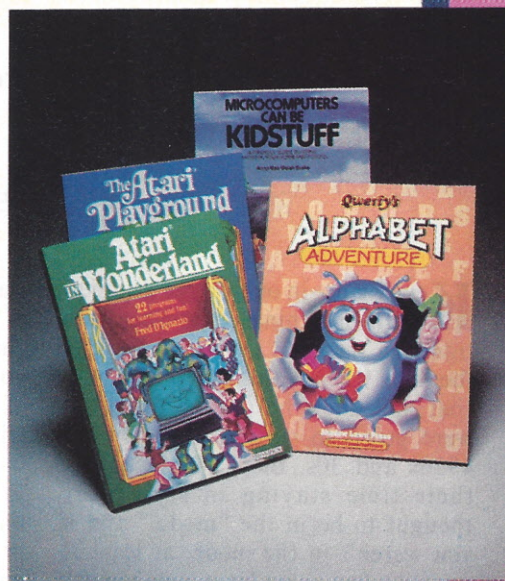
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# Keeping Up With Jones

Staying abreast of personal computing isn't trendy—it's smart strategy for success in a new age.

*by Ernest Baxter, Managing Editor*

Keeping up, in one way or another, with one thing or another, is a tradition that can be traced back to the days when Cain looked at Abel's coat and knew he needed one if he were going to stay in style. In the 1920s and 30s, those who spent all their time staying in style were thought to be in the "mode," and if you weren't in the mode, at least to people a few years later, you weren't keeping up with the Joneses. Not long thereafter, if you weren't abreast of the Joneses, you were not "with it," which meant that you were "out of it." You simply had to be "hip to what was happening" or today, you run the decided risk of being declared "groady to the max," a no-nonsense declaration which means that you are one of those people whose mere presence in a room is enough to gag others with a spoon.

But the percentage of people who are compelled to live their lives within an arbitrary set of rules laid down as canon by the tastemakers of the day has always been relatively small. The need to stay current with this or that thing or person, at least on a national basis among mature adults, has mostly been viewed from the intelligent perspective of "who cares?" There are, of course, reasons for this.

For one thing, it wasn't as if you faced economic ruin if you were unaware that the four-door, fake-woody

wagon parked in your drive was out of style. Life went on relatively unchanged and seemingly unaware that you were schlepping around in a set of wheels that a lot of your hipper friends would have parked down the block. It wasn't as if you were going to lose your job (unless, that is, you happened to play string bass in a progressive jazz combo) when someone told you they were going to smoke a joint and you thought they were talking about a procedure used by plumbers to ensure the integrity of your lawn sprinkler.

In the grand scheme of things—indeed, in the grander scheme of an individual's life and goals—being "abreast of the Joneses" hardly matters at all. What matters is the number inside that little box on your paycheck. What matters is whether or not the heir apparent is doing well enough in school to get into the college of your choice—and in the deal, out of your house and hair. What matters is the price of a gallon of gas at the local filling station. What matters is inflation and war and health. What matters, then as now, is finding ways and means to ensure that the share of the American Pie dished up on your plate is of a size and thickness equal to your needs—and how much is left over after those needs are met.

And it is on that point that personal computing, and keeping up with

Jones, suddenly take on an important dimension.

When personal computers came onto the American scene, the tastemakers did not, en masse, declare them the newest icon of hip. What compelled people to buy them, at least in the beginning, was a grass roots perception that they were machines which virtually anyone could use to quantitatively—as well as qualitatively—improve personal performance. No one was being urged to buy a computer—and the software that ran it—just because it looked marvelous with a carefully arranged flower grouping stuck in its disk drives. And no one *simply had to have one* because Jones had one parked on his coffee table. People bought them because the Jones who occupied the office down the hall had one on his desk and was using it to do his spreadsheet work in a third of the time it was taking everyone else in the department to do it. People to whom careers and advancement mattered rushed to keep up with Jones-Down-The-Hall because Jones-Down-The-Hall, with neat printouts tucked under his arm, was being invited into the executive conference room for lunch with the CEO.

But the tastemakers simmered. Here was something brand new and yet, there seemed no apparent way for them to use it, to turn it into their newest discovery. But they are clever



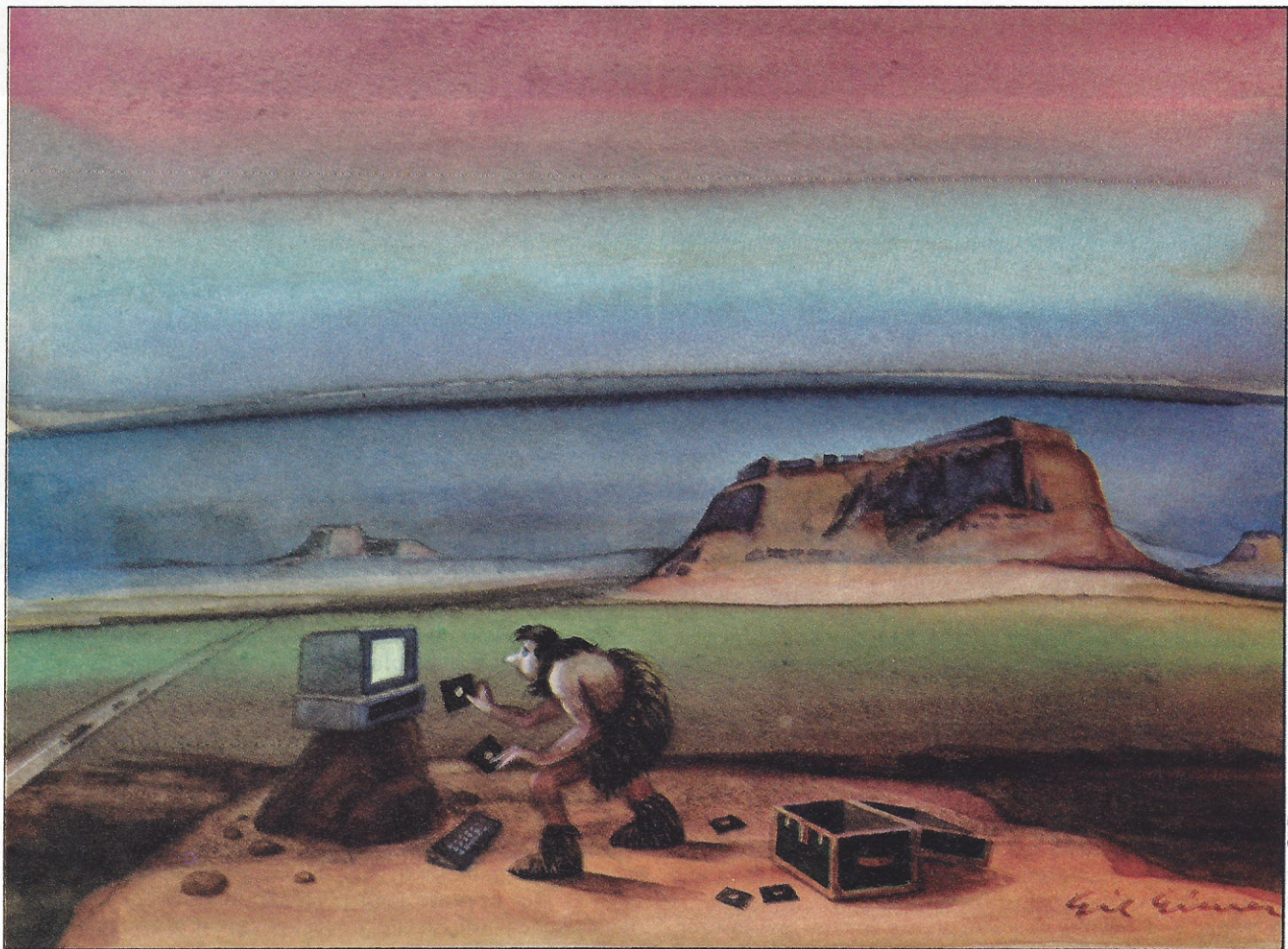


Illustration by Gil Eisner

fellows, after all, and they rose to the occasion—they simply incorporated the language of computing into polite conversation and created in the process a glamor for the language of the hardware. They chose to ignore the software because software was what the great unwashed used to do work. To be *au courant* with software meant that you actually intended to use the computer *to work*.

Bits and bytes, bauds by the baker's dozen, interfaces, in-out gates, virtual memory, RAM, ROM, CRTs, matrices and modems. Now those were words a tastemaker could do something with—and do something with them they did. Cocktail parties and late night rendezvous were sprinkled with cooings of inter-

facings. Matrices—an odd choice, actually, given its origins—became the glamorous way to describe anything that intersected with something else (picture Humphrey Bogart inquiring of Ingrid Bergman whether or not she was interested in resuming their Paris matrix). But in glamorizing words created by intelligent people to describe highly complex processes and things, the tastemakers managed to lull the unwary into a contentment with the software they had.

It is, in some ways, an attractive contentment. For one thing, software requires an investment of time and energy, to say nothing at all of the going-in price. For those who have labored over documentation that,

well, missed the English language by a breadth equal to that of Chesapeake Bay, the idea of doing it all over again just to gain a few added features is one whose time will never come. Why re-invent the wheel? Besides, as the tastemakers pointed out, the language of the hardware was everything.

To those people who are willing to believe that cars can exist as mechanical devices capable of doing work—in the absence of gas stations—the notion that computing hardware could exist in the absence of software would make a lot of sense. Which was, fundamentally, the theme of the tastemaker's tune. To the extent that some people were so lulled, the potential of computing passed them by.





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*When personal computers came onto the American scene, the tastemakers did not declare them the newest icon of hip.*

ESSAY

It is simply a fact, a truth, that to the extent that people allow the advances of software to go undetected, to the extent they choose to ignore the new and innovative, they diminish the reason for buying a computer in the first place. And this diminution operates across the entire spectrum of reasons for buying and using a computer.

Consider word processing, still one of the leading reasons for buying a personal computer. Not very long ago, word processing packages, then in the infancy of their development, were able to do few things, and virtually nothing that was out of the realm of writing and formatting words. Even the formatting commands were limited, and most packages were constructed in such a way as to be nothing more, really, than a replacement for a typewriter. Top-of-the-line packages did let you "cut and paste"—you could move around blocks of type—and one or two of the very high-end packages added communications capabilities. That, as Poe's raven meant to say, and nothing more.

But as the hardware manufacturers worked to add important features to their systems (they too, ignored the tastemakers on grounds of both taste and intelligence), the software people were busy adding features of their own to their software. MicroPro's WordStar, for example, considered by many to be the top of the line in word processors, already had a spelling checker. But with the introduction of 16-bit machines, and significantly larger memories, MicroPro saw an opportunity to advance the state of the art of word processing by introducing CorrectStar, a "watershed development in spelling corrector technology for microcomputers." That claim, from the user's point of view, is something of an understatement.

Released on March 13, 1984, CorrectStar frees the user from virtually all of the grunt work involved in

proofreading a document. What it does, in simple terms, is to look through a document to find words not found in its lexical data base. It then suggests alternative spellings—or words, if it thinks your word is wrong. You can choose, from a simple menu, to accept CorrectStar's choice (and you are given the option of correcting the word "globally," which means everywhere it appears in the document) look at the next suggestion (another word the program thinks you may want to use in place of the one it found), add the word to your personal dictionary, ignore the word, or enter your own correction.

But that's only the tip of this technological iceberg. The lexical data base is made up of 65,000 words (which represent, according to MicroPro, 99 percent of the most commonly used words) based on frequency studies done by Houghton Mifflin Company. The words in the data base come from the much-respected *American Heritage Dictionary*. Dr. Henry Kucera of Brown University headed the research team which developed the algorithm used with the data base. The accuracy of the suggested replacement words, derived from the combination of Kucera's algorithm and Houghton Mifflin's data base, is in the area of 80 percent.

What that combination does, says MicroPro, is to "... give the program the ability to analyze words based on phonetic and linguistic principles and to recognize the patterns that characterize language." And that is State Of The Art Stuff.

What programs like CorrectStar give Jones-Down-The-Hall is a way in which to whip through documents secure in the knowledge that his report will go into the front office clean as the driven snow. And to top it off, his report will be there first. Not only that, Jones-Down-The-Hall will have plenty of energy left to begin his next assignment.

That's an important by-product.

Energy—especially creative, productive energy—is a capital sum. To expend that "sum" on grunt work is, to put it tactfully, dumb. For those under the spell of the tastemaker's language, that one program, and its very considerable benefits, will go unnoticed and the reason they bought their computer will have been diminished.

But since Jones-Down-The-Hall has not been content to be content with the software he started out with, consider another, and very new class of software, and the implications of it to Jones-Down-The-Hall and to his competitors who are letting software developments pass them by.

Decision Support Software, or "idea processors," is a category of software designed to help the user make better decisions. ThinkTank, a program created and sold by Living Videotext, Inc., is a prime example. What ThinkTank does is provide the user with a way in which to randomly input ideas in the form of words, sentences, or numbers, and then rearrange that data into an outline. Once the outline is created, the user can move any of the headings around so that their order suits the point he is trying to make. Not only that, the user is able to enter subordinate headings—as many as he likes, really—under each of those headings. Through an edit function (the program has an "integrated" word processor), the user can enter text beneath the headings, the sub-heads, or both. By using the "collapse" function, he can "hide" that text from view, leaving only the outline visible.

When the user is finished with the outline, and the text, he can then "port" the file—or any part of it—into, among other things, a word processor package. One of the packages that ThinkTank supports is, of course, WordStar.

JONES-DOWN-THE-HALL, who has been watching software developments as closely as he has been watching hardware developments,



## *JONES-DOWN-THE-HALL is now JONES-IN-THE-OFFICE-IN-THE-CORNER and now you are YOU-DOWN-THE-HALL.*

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has seen ThinkTank. He realizes, because he is constantly looking for packages to help him in his pursuit of a bigger slice of the American Pie, that this program will not only give him a way to write reports that are flawlessly organized—and make the points he wants made with great clarity—it is also a program that provides him with a unique new tool *which he can use to analyze such things as the competition's reports.* JONES-DOWN-THE-HALL is, as they say, on a roll.

Consider, for purposes of argument, a relatively Machiavellian scenario based on JONES-DOWN-THE-HALL's perception that his presence in your office—next to the guy in the corner office, would do wonders for its decoration.

A problem has developed in a key sales territory. Each of the company's representatives has been asked to submit detailed reports on their daily sales activities—and an in-depth analysis of the company's position vis-a-vis the competition. JONES-DOWN-THE-HALL is one of the people assigned to the study group to analyze the reports coming in from the field for useful intelligence on the problem. The members of the study team are given copies of the reports and told that they have five days to prepare for a meeting with the sales manager to discuss their findings, and to suggest ways and means to correct those problems—when the CEO joins the meeting.

JONES-DOWN-THE-HALL is a blur of energy and activity. His secretary is moving even faster, as she frantically inputs each of the 10 reports from the field into THOR, another "thought processor" package Jones has discovered, put out by Fastware, Inc. As his secretary finishes with each of the reports, JONES-DOWN-THE-HALL goes through them. Using THOR's text highlight feature (which allows him to put text in reverse video), he highlights what seem to him to be the central ideas in

each of the reports. When he has finished, he deletes everything except the highlighted text.

At this point, JONES-DOWN-THE-HALL, being a reasonable fellow, goes to lunch. But not, however, alone. He is the model of sympathy as he listens to each member of the study group bemoan the fact that the problem is complex, and *really, really* does require more than five days of analysis. He is understanding as dour descriptions are forthcoming about the nature and dimension of the task. He does yeoman duty as a stand-in analyst when Lamont Woode allows as how he has recently been overcome by remorse for not having finished dental hygienist school. But JONES-DOWN-THE-HALL has nothing to add to the group discussion. He is the only one who has been spending full-time at his computer.

Back in the office, JONES-DOWN-THE-HALL disappears behind closed doors for the entire afternoon. His secretary is under the strictest of orders not to disturb him for anything less than a full-scale invasion of San Francisco.

His next move is simplicity itself. He prints out each of the selected lines from the reports and studies them for what he plans to call 'an intuitive grasp of the problem' at the annual dinner honoring that employee who has made the most significant contribution to the company over the past 12 months. In fact, what he's looking for is word frequency, especially adjectives, used to modify important nouns. He determines that there will be five major categories of input: product price; product performance; salesman's excuse; customer's excuse, and miscellaneous. By using the powerful sort functions of the program, JONES-DOWN-THE-HALL is able to see that the problem is not with the product, nor is it with the competition. The problem is that in this particular territory—which puts a major percentage


of the company's black ink on the bottom line—the territory manager has become increasingly disillusioned with his commission structure. In fact, so disillusioned is the manager that he has simply stopped managing his men. The men, seeing the change, have retreated from what they perceive to be the impending line of fire.

The report JONES-DOWN-THE-HALL presents to the president, after the discussion group has ground to a halt, and after the president has noted a typo in the group report, is magnificent. It is filled with insight backed up with hard facts gleaned from the reports. It is relentless in its progress toward a solution; its conclusion is inescapable. And JONES-DOWN-THE-HALL is now JONES-IN-THE-OFFICE-NEXT-TO-THE-GUY-IN-THE-CORNER. You, on the other hand, are now YOU-DOWN-THE-HALL. Lamont Woode has returned to dental hygiene school.

Does this mean that the wise personal computer user should abandon his watchfulness vis-a-vis hardware? Does it mean that every worthwhile advance in the state of the art of personal computing will come from the software? And does this mean that every personal computer user is as Machiavellian as JONES-IN-THE-OFFICE-NEXT-TO-THE-GUY-IN-THE-CORNER?

The answer, for those people who don't move their lips when they read, is an obvious NO. But the siren song of the tastemaker, intent on being part of what he will later denigratingly describe as "the scene," is seductive. Glamor is, after all, glamor and work is hard.

But cars, as we have noted, don't do anything without fuel. You can sit in them, or on them, or near them; you can design them, polish them or ignore them; but without fuel, they aren't going to take you where you want—or have—to go.

For the personal computer user, it is the analogy of moment. 



# FINALLY: ACCOUNTING SOFTWARE THAT WORKS THE WAY YOU WORK.

That's why over 1,000 companies a week are putting BOOKS!™ into their work.

You get a complete system for automating your General Ledger, Accounts Receivable, and Accounts Payable. (And there are optional modules for Budgeting, Recurring Entries, Invoice Printing, and Checkwriting.)

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Unlike any other accounting software, all you need is your own understanding of accounting, and a personal computer.

# The General Ledger prompts you rapidly through simple or complex journal entries, handles more accounts than you can ever possibly use, allows instant adjustments, always maintains full audit trails, and delivers any of a full range of financial reports at any time. (That's for starters.)

# The Accounts Receivable handles complete customer detail and totals, prints aging reports the way you like to see them, (open item, balance forward, whatever), and handles ANY NUMBER of Receivable accounts.

# The Accounts Receivable also prints an invoice register, customer statements, and keeps a customer listing with shipping and billing information. (That's for starters.)

# The Accounts Payable prints aging reports the way you like them, prints a check register, gives you vendor totals by month and year, lets you pay on account, by invoice, by partial invoice, or with automated repetitive payment schedules, and will contain ANY NUMBER of Accounts Payable accounts. (That's for starters.)

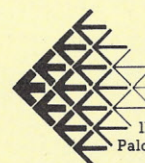
# You get four optional modules that you can review at your convenience, and 'unlock' for full use with a phone purchase from your dealer: BUDGETING, RECURRING ENTRIES, INVOICE PRINTING, and CHECK WRITING. It all adds up to the best investment in your accounting productivity that a software dollar can make.

# BOOKS! will run on practically any personal computer you might own or want to own, and can be seen at practically any computer retailer who is serious about selling the best in accounting software.

It's time for you to automate.

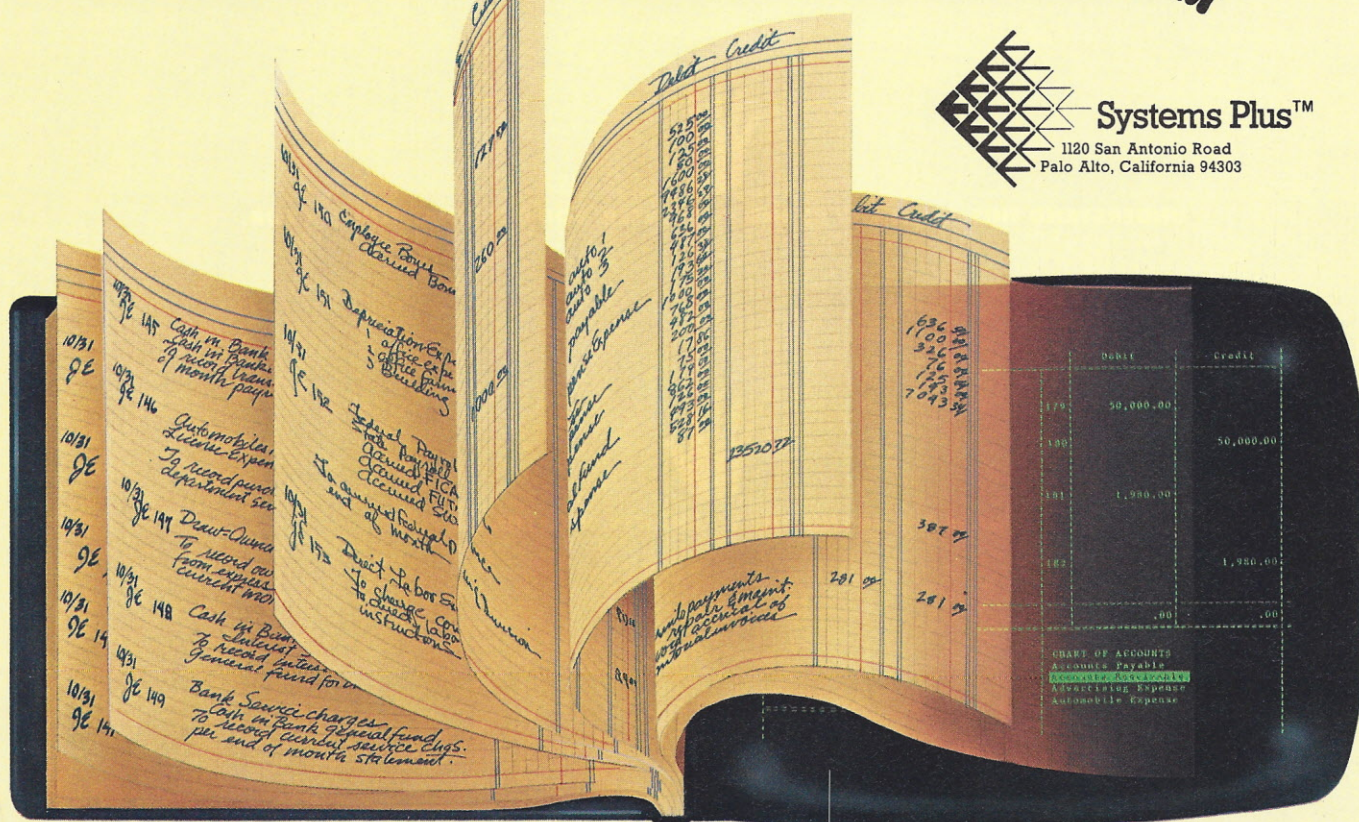
If you can't find a dealer, call (800) 222-7701; in California (415) 969-7047. We'll send you complete information, and the name of your nearest BOOKS! retailer.

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# HOW TO PICK A PRINTER:

## (A survivor's guide.)



### WRITE DOWN WHAT YOU NEED ONE FOR IN THE FIRST PLACE.

And then the second place. And third place (Letters to customers, newsletters, financial reports, etc.). In other words, set down your priorities, in black and white—which will go a long way toward keeping you out of the red. Because the price of a printer is almost directly proportional first to the quality of its printing, and second to how fast it prints.



### THERE ARE TWO KINDS OF PRINTERS IN THIS WORLD. CHOOSE ONE.

Either "letter-quality," which gives you text that you can't tell from hand-typed copy... or "dot-matrix," which, with a C. Itoh printer, looks like this. (Most other dot-matrix, or "business printers" have a far flimsier dot pattern, and give you copy that looks like a bad job of spray painting.) The former is for formal:

reports to clients, final drafts of boilerplate, contracts, or letters to the President.

It prints with easily available "daisy wheels," similar to those on many typewriters. It's the "show" part of Show and Tell and its price reflects it.

Letter-quality printers generally cost about a grand more than their dot-matrix counterpart. Dot-matrix printers are made for the "tell" functions: things like financial data, interoffice memos, authors' first drafts, or "dumping" a bunch of programming data onto hard copy for reference or de-bugging.

Not fancy, but functional. And, comparatively, cheap.



### FIGURE OUT HOW FAST YOU NEED WHAT.

Because the higher the speed, the higher the price—typically several hundred bucks per significant speed jump. (About speed: It's measured in "cps," or "characters per second.") A standard business letter contains about 1,000 characters. So, at 18 cps, it takes about a page per minute to print.

Therefore, you have to ask yourself if it's worth an extra \$500 to double the speed with another letter-quality printer. If you churn out lots of copy, the answer is probably yes; if you grind out only a dozen letters a day, it's probably no.



### UNDERSTAND THIS: WITH ANY BRAND OF PRINTER, YOU GET WHAT YOU PAY FOR.

If you buy a Brand-X printer for \$1,000, it's going to be better or faster or somehow gooder than the same brand that costs \$500.

In the case of the C. Itoh line of printers, the same holds true. Even though we promise that at every price point you're getting the very highest value for the very lowest buck. By a long shot.

And that's a gross understatement.



### BEWARE THE BRAND, THE WARRANTY, AND THE SERVICE.

No printer is perfect. (At least not forever.)

Which is why most other brands come with a 90-day warranty, a service policy that requires a lawyer, and a repair department in Des Moines or someplace.

Nor do we claim perfection. But every C. Itoh printer is backed by a full-year warranty.

Check the chart (opposite). And if you still have questions, we still have people with answers. Call toll-free.



# WHICH PRINTER TO PICK:

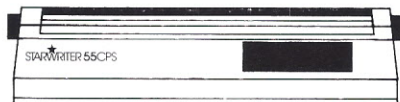
(A survivor's friend.)



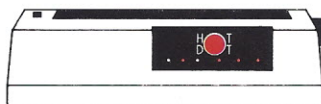
**18 CPS LETTER-QUALITY PRINTER**



**40 CPS LETTER-QUALITY PRINTER**



**55 CPS LETTER-QUALITY PRINTER**



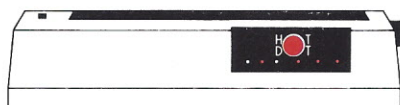
**180 CPS DOT-MATRIX PRINTER**



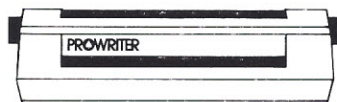
**WIDE-CARRIAGE 180 CPS DOT-MATRIX PRINTER**



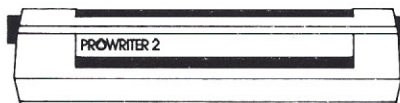
**180 CPS COLOR DOT-MATRIX PRINTER**



**WIDE-CARRIAGE 180 CPS COLOR DOT-MATRIX PRINTER**



**120 CPS DOT-MATRIX PRINTER**



**WIDE-CARRIAGE 120 CPS DOT-MATRIX PRINTER**



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CIRCLE 32



# QUADJET™ BY QUADRAM™

Quadram's new Quadjet ink jet printer is the ideal choice for your color graphics hard copy. It can take all your ideas and put them down on paper. So things like business, scientific and engineering applications are all of a sudden clearer and more meaningful.

## Colors to tempt the palette.

With Quadjet you can color your charts, graphs and diagrams black, red, green, yellow, cyan, blue or magenta. Use all seven of them together, or in any combination. The color scheme is up to you.

Of course, Quadjet prints text as well as graphics, including standard and enlarged characters. With a maximum graphics resolution of 640 dots/line, your projects are printed crisply and clearly every time.

**OUTSTANDING  
COLOR GRAPHICS  
AT AN INCREDIBLY  
AFFORDABLE PRICE.**

## Quadjet fits in.

Quadjet is small and portable so you can put it just where you want it. Don't worry about the noise. State-of-the-art ink jet technology makes printing whisper quiet.



Quadjet uses disposable ink cartridges that are a snap to change. Just pop the old one out and the new one in. You'll find that each one prints about 4 million characters. As for paper, any 8½" sheet will do, whether it's form fed, sheet fed or some other kind.

## A word about compatibility.

A standard centronics parallel interface makes Quadjet compatible with your IBM PC, XT or Apple computer. And if you have

Quadram's Quadlink that allows you to use Apple software with your IBM PC, Quadjet can work that way too.

An easy-to-use software package lets you and Quadjet get down to business right away.

## The quality you've come to expect.

Quadram put the same kind of quality into Quadjet that you find in all Quadram products.

Considering all of Quadjet's features, we'll let you draw your own conclusions. We think you'll find Quadjet gives you unsurpassed Quadram quality at an incredibly affordable price.



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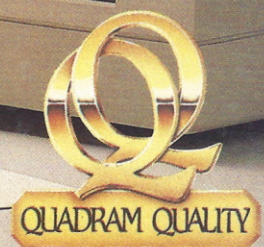
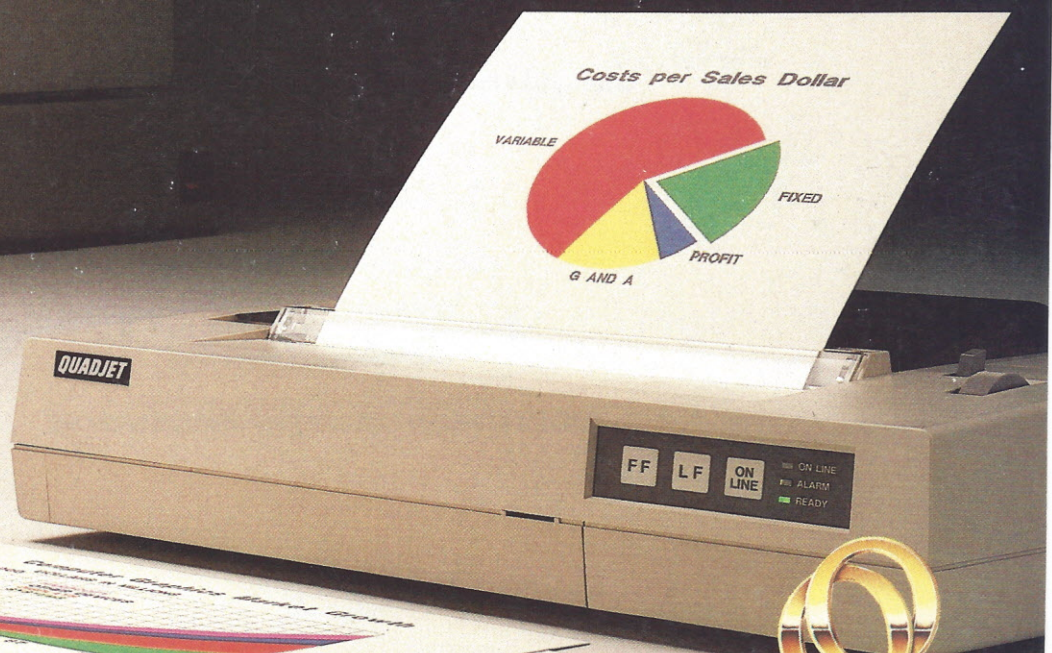
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